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

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Milkfat Test
Results

Tests to
Determine the
Safety of Cheeses

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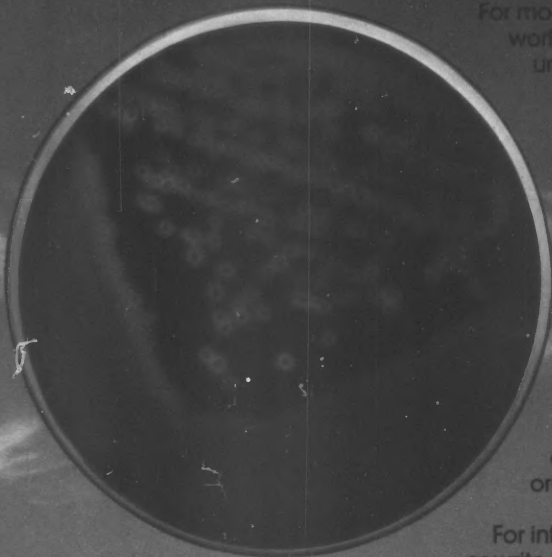


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The Variation Between Milkfat Test Results

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The subject that shall be addressed in this paper, that of the variation between milkfat test results, is one which, among dairy experts, can be controversial.

Basically, there are three types of tests used to determine the butterfat content of a milk sample. These tests are the chemical method, the electronic method and the graphite and parchment method.

The *chemical method*, which is a direct method in that you are physically measuring or weighing the butterfat contained in the sample. This method includes the Roese-Gottlieb ether extraction test, Mojonnier test, the Babcock test, and the Gerber test.

Another method of testing milk for butterfat is the *electronic method*, which is an indirect test in that a machine is calibrated to a chemical test to interpret and read the amount of light passing through a photocell, in the case of turbidimetric instruments such as a Milko-Tester, or the amount of infrared energy absorbed by the butterfat or other components in milk, such as in the case of the infrared instruments like the Multi-Spec and Milko-Scan, or by the near infrared instrument such as the Technicon.

The third type of test is the *graphite and parchment method*, better known by some in the industry as a "pencil test." This, I believe, needs no further explanation.

Before variations between milkfat test results can be discussed, it is necessary to first review a little history about the Babcock test. In 1890, the Babcock test for determining butterfat content of milk was first introduced by Dr. Stephen M. Babcock of the University of Wisconsin. It is interesting to note that Dr. Babcock had to read his test results to the top of the meniscus in order to get it to compare with the standard test—the Roese-Gottlieb ether extraction test. Because it was simple and relatively inexpensive, the Babcock test was readily accepted by the dairy industry of this country. It has been widely used for the past 90 plus years, with the only changes being refinements in techniques and equipment, combined with modifications to accommodate testing of processed milk and milk products. There has also been a certain amount of effort toward standardization of procedures for uniformity. This standardization of procedures will be discussed in more detail later in this report.

As the dairy industry changed in the years following 1890, the refinements and modifications in the Babcock tests were instituted as a matter of necessity. As the testing of producer milk samples moved from the milk plant boiler rooms and workshops into laboratories, improvements in equipment and techniques

resulted. Pricing programs which recognized a value for butterfat became more refined, and more emphasis was placed upon plant butterfat accounting. Many great dairy chemists contributed research which helped the Babcock test perform as expected. Modifications were developed and recommended for testing products such as cream, skim, buttermilk, homogenized milk, chocolate milk, and so forth.

At a time when the use of electronic machines for testing milk for butterfat and other milk components such as protein and lactose are moving ahead at a very rapid pace, it must be remembered that these electronic devices must be calibrated for butterfat and other components at levels determined by a chemical test.

As a result of the importance the chemical tests play in the calibration and control of electronic instruments, "A Study Of The Babcock Method For Testing Raw Milk" was undertaken nearly 10 years ago by 11 Market Administrators' laboratories. The procedures recommended by this group of laboratories helped to improve the accuracy and consistency of the Babcock test. Several of the more important recommendations this group made were adopted and added to the 12th edition of the *Official Methods of Analysis of the Association of Official Analytical Chemists*.

The two most important recommendations, in my opinion, were (1) that all fresh milk samples be warmed and pipetted at a temperature between 95° and 100°F, rather than 70° as in the past, and (2) that the Babcock fat column be read to the nearest .05 percent fat rather than to the nearest .10 percent fat, as had been the practice previously.

I would point out that, by increasing the temperature while still using the same pipette calibrated at 68°F, the amount of milk delivered into the Babcock test bottle is less. The effect of this change, in my opinion, brings the Babcock test closer to the official Roese-Gottlieb ether extraction results. I would also note that changing the reading to the nearest .05 percent was an attempt to make the Babcock test more precise. Whether or not this goal was achieved is a matter of opinion, since the study also looked at some of the various other problems associated with the Babcock test which can cause questionable results. These include test bottle calibration, pipette calibration, drainage time, speed of the centrifuge, temperatures, tempering time, effect of too strong or too weak acid and its effect upon reaction temperature (which should be 212° to 221°F), the influence of the reading light, reading devices, reading differences between various technicians, and differences between laboratories, to name but a few.

I think it would be agreed that the Babcock test has served the industry fairly well over the years. However, its accuracy and reproducibility is less than desirable, especially, in my opinion, when it comes to the calibration and control of the new electronic instruments being used for testing milk for butterfat today. It is interesting to note that the various manufacturers of electronic testing instruments used the official Roese-Gottlieb ether extraction method for the determination of butterfat in the research necessary to get their instruments approved by AOAC. In all of their sales literature, they will cite the accuracy of the machine as it relates to Roese-Gottlieb ether extraction for butterfat. The Roese-Gottlieb ether extraction method is recognized

worldwide and is the official method to be used in settling disputes. A footnote in the AOAC manual states under the Roese-Gottlieb method that, "(Details of this method comply with method which has been agreed upon by International Dairy Federation, International Organization for Standardization, and AOAC for publication by each organization and which is published as international std FAO/WHO Code of Principles Concerning Milk and Milk Products and Associated Standards.)" One of the reasons, in my opinion, that the Roese-Gottlieb ether extraction method is used for international standards and cases of dispute is that the accuracy of duplicate determinations is held to within .03 percent butterfat. Another reason is that the butterfat test as determined by the Roese-Gottlieb method is not an individual judgment, as in the Babcock or Gerber methods, where a technician reads the top and bottom of a meniscus. In the Roese-Gottlieb method, the sample is weighed and the butterfat test determined by subtraction of weights which removes the judgment element.

Concluding this review of the testing history, we will now deal more specifically with the topic: "The Variation Between Milkfat Test Results." Nowadays, when we start to talk about variations in tests--be it for butterfat or other milk components--

we immediately become involved in statistics. Although I am not a statistician, I would like to review with you very briefly several statistical terms which are commonly used in comparing two sets of test results: the average difference (\bar{D}) and standard deviation (S_D). First, I should try to answer the question: What is statistics? Statistics is a branch of applied mathematics concerned with the design of experiments or sampling procedures, and analysis of data, and the making of inferences about the population of measurements from information contained in a sample. Statistics can be used to compare one set of butterfat tests with another, or compare testing methods such as Babcock versus ether extraction, or either of these chemical methods against electronic testers, to see whether the results compare within a reasonable statistical difference. As I have stated, the two most common statistical measurements are (1) average difference, also known as a mean difference or the difference between the mean; and (2) the standard deviation.

In Chart #1, the column labeled "Laboratory A" represents test results determined by one laboratory or one technician, and in the column labeled "Laboratory B" are the tests represented by a second laboratory or technician. This could also represent two different methods of testing. The

#1

Laboratory "A"	Laboratory "B"	Differences A to B
3.50%	3.60%	-.10%
3.70	3.90	-.20
4.00	3.90	+.10
3.25	3.20	+.05
3.40	3.60	-.20
3.55	3.70	-.15
3.80	3.90	-.10
3.90	3.80	+.10
4.15	4.20	-.05
5.05	5.20	-.15
38.30	39.00	
+	÷	
10	10	
"	"	
3.83%	3.90%	Mean

Average Difference \bar{D} 3.83 - 3.90 = .07

mean is a form of average--the sum of a set of numbers divided by the number of elements in the set. On the chart, they are 3.83% and 3.90%. The average difference is the difference between the mean of two sets of test results, shown in the chart as .07%.

However, the average difference may not reveal the true difference between the two sets of tests. For example, if half the tests were well below the true test and the other half were of a similar magnitude higher than the true test, the average difference would be close to zero. Therefore, a measure of the variability in both sets of tests is necessary. The most common measure of variability is the standard deviation (S_D). The standard deviation is the average amount by which each number in a distribution differs from the mean of the distribution.

In Diagram #2, imagine that each dot shown represents a number in a distribution and that the horizontal line represents the mean of these numbers. The vertical lines represent the difference between each number and the mean of the distribution; the standard deviation is the average of these differences.

In Chart #3, this gives a better example of how the average difference (mean bias) and standard deviation can be used in the laboratory. Pictured is a simple (may not be appropriately named) linear regression program which compares the electronic testing instrument to the chemical test to which it was calibrated. As can be seen in the chart, the mean or average difference was .003 and the standard deviation was .013.

#3

Simple Linear Progression Program

Machine: 021	Date: 02/24/84	Component: Butterfat
Chemical Value	Machine Result	Difference
3.76	3.78	.02
3.76	3.77	.01
3.84	3.84	0
3.84	3.85	.01
3.34	3.35	.01
3.34	3.35	.01
3.44	3.44	0
3.44	3.44	0
4.26	4.26	0
4.26	4.27	.01
4.87	4.84	-.03
4.87	4.86	-.01
4.68	4.66	-.02
4.68	4.66	-.02
4.75	4.74	-.01
4.75	4.76	.01
5.59	5.58	-.01
5.59	5.58	-.01
4.98	4.97	-.01
4.98	4.96	-.02

Mean Bias: -.003
Standard Deviation: .013416

In Chart and Graph #4, the mean bias was .002 and the standard deviation was .027. I might point out that this particular instrument is located at our laboratory in White River Junction, Vermont, and is calibrated to a Roesse-Gottlieb ether extraction. Note on the graph that the computer has graphically shown where the individual tests intersect with the mean. This can be a great help if the machine is out of calibration, because it shows the machine operator which direction he should change the shift value to bring the machine into calibration, providing there are no

mechanical or electrical problems with the instrument.

In New England, an electronic machine is considered to be in calibration if the \bar{D} (average difference) is plus or minus 0.02 percent and the standard deviation is 0.04 percent in the case of calibration to the Roesse-Gottlieb ether extraction method, and a \bar{D} of plus or minus 0.04 percent and a standard deviation of 0.06 percent when calibrated to either the Gerber or Babcock test.

In the case of the Market Administrator's laboratory for Federal Order No. 1, we have chosen to calibrate and maintain the accuracy of our machine by the Roesse-Gottlieb ether extraction method, which is a full three extractions and not the two extractions as in the case of the Mojonier test. We have found through studies that the third extraction recovers about .02 percent more butterfat. One of our principal reasons for selecting the ether extraction test is because the electronic instruments are accurate to two places beyond the decimal point. We wanted to calibrate

#2

Standard Deviation



#4

Simple Linear Regression Program

Machine 021	Date 03/26/84	Component: Butterfat
Chemical Value	Machine Result	Difference
3.73	3.69	-.04
3.73	3.72	-.01
3.54	3.57	.03
3.54	3.56	.02
3.42	3.44	.02
3.42	3.42	0
3.5	3.58	.05
3.53	3.58	.05
4.17	4.13	-.04
4.17	4.19	.02
5.26	5.25	-.01
5.26	5.24	-.02
4.92	4.29	0
4.92	4.9	-.02
4.93	4.93	0
4.93	4.94	.01
5.34	5.33	-.01
5.34	5.3	-.04
5.09	5.12	.03
5.09	5.09	0

Mean Bias: .002

Standard Deviation: .027067

our instrument to the most accurate test that we could find.

Whatever testing method is selected, it is critical that testing procedures be standardized in the laboratory or between laboratories. In addition, every precaution should be taken to assure the integrity and accuracy of the samples used to control the accuracy of electronic instruments. A general guide is that these samples should be made up of the same type of milk as the samples which the machine will be testing. For example, if the instrument will be used for testing producer payment samples, the control and calibration samples should be made up of raw bulk herd milk. Blended or commingled samples of milk from more than one herd are acceptable. Fat adjusted samples made by adding or removing skim milk or cream are not acceptable, because they can affect the accuracy of the instrument's determinations. This is especially true on infrared instruments where a percentage of one component in the sample has an effect on the instrument's readout of another compo-

nent. We recommend that the source of the milk used to make up the control and calibration samples be screened for quality by performing quality checks such as the acid degree value (hydrolytic rancidity, churning of the milk) and somatic cell counts, which can have an effect on the keeping quality of the samples and has a direct effect on the protein test. In addition, milk sources should be monitored on an ongoing basis for normal response by the electronic testing instruments. Research has shown that certain herd feeding situations--such as feeding of cottonseed--can have a detrimental effect on the accuracy of the butterfat test of the milk as determined by the instrument. Such milks should not be used for controlling the accuracy of the instruments.

Butterfat reference tests used in your particular laboratory--be it Babcock, Gerber, Mojonier, or Roes-Gottlieb ether extraction methods--should be tested in triplicate to ensure optimum accuracy. Individual determinations should be made to at least the nearest 0.05 percent butter-

fat in the case of Babcock and Gerber, and to at least 0.01 percent in the case of ether extraction. Only if consistent and correct procedures are followed can an acceptable variation between milkfat test results be determined. Each step followed by the technician, as well as his own experience and the equipment available to him, are critical to the outcome of the test. I firmly believe also that the attitude of the technician making the original test is of equal importance to all of the required equipment, glassware, and testing procedures. Unless the technician sincerely desires accurate and repeatable results, some degree of doubt may remain as to the validity of his test results. Good judgment on the part of the tester is of primary importance to an effective testing program. Even more critical, however, is the sample itself. The best procedures, equipment and staff will be of no avail if the sample is poorly prepared, in questionable condition, or if its composition is different from the load of milk it represents.

In 1973, electronic testing instruments were becoming increasingly popular for butterfat testing, because they offered a rapid and economical means of testing milk samples. At that time, the Market Administrator's office for the New England marketing area studied the difference between milkfat test results as determined by the Roes-Gottlieb ether extraction method and the Babcock method. This study was conducted to see which reference test method should be used for controlling the accuracy of electronic machines. In some of the initial work done on electronic machines in the United States, the Babcock method had been used for this purpose. The use of the Babcock method for testing of reference samples may have been, in our opinion, a poor choice. The precision of this method expressed as a standard deviation is reported in literature as ranging from 0.042 to 0.077 percent. By comparison, the Roes-Gottlieb ether extraction method had reported standard deviations ranging from 0.009 to 0.036 percent.

Over the past 50 years, Babcock

test results have averaged higher than ether extraction results by 0.05 percent to 0.07 percent for whole milk. It should be pointed out that during this period there have been modifications in both the laboratory equipment and procedures used in the two testing methods.

Our study examined, under closely controlled conditions, the relationship between the Babcock and Roese-Gottlieb methods of testing normal, bulk herd milk for butterfat content. Our prime interest was to provide data to evaluate the effect on the test level when the Roese-Gottlieb method was employed as a reference testing method for the calibration and control of electronic milk testing devices.

The results of our study showed that the average Babcock value for the 216 samples tested was 0.031 percent above the average value for the Roese-Gottlieb method, for milk containing 3.066 to 5.580 percent butterfat. The standard deviation of the Babcock and Roese-Gottlieb methods were 0.039 and 0.010 percent, respectively. I would point out that the average difference on samples testing between 3.099 to 4.099 percent was 0.02 percent. On those samples testing 4.100 to 5.599 percent, the difference between Babcock

and Roese-Gottlieb was 0.05 percent, with an average difference of 0.031 percent.

In trying to put another handle on what should be acceptable variations between milk test results, we have computed the standard deviation for our Milko-Tester, Roese-Gottlieb ether extraction test, Babcock test, and the standard deviation of differences between our Milko-Tester results versus our Roese-Gottlieb ether extraction results.

The standard deviation of the Babcock test as performed in our laboratory in White River Junction, Vermont, presently is .04 percent. This is in very close agreement with the 0.039 S_D found in 1973. The standard deviation of the Roese-Gottlieb ether extraction test is .01 percent, the same as in 1973. The standard deviation of the Milko-Tester is .01 percent when based on replicate readings made at the same time. In comparing the test differences between our Mark III Industrial Milko-Tester with samples tested in duplicate to triplicate determinations by Roese-Gottlieb, the S_D of differences is .03 percent when based on replicate determination made from different sublots at different times.

The final chart, #5, compares our Roese-Gottlieb ether extraction tests,

our Babcock tests, and our Milko-Tester tests for the 20 calibration samples used each week. It can be seen that the variation is relatively small. This indicates to me that under good conditions, following standardized testing procedures with good equipment and using good samples, the variation between individual tests can be minimized. (The starred results indicate that the Milko-Tester was recalibrated when the differences between the Roese-Gottlieb and the Milko-Tester exceed .025%.) However, the prerequisite to this close agreement is the establishment of uniform testing procedures within an individual laboratory and between laboratories. Until this is achieved, the variation between milkfat test results will be as large as the poorest run laboratory.

I firmly believe that the time is here and now for Federal and state regulatory agencies, together with laboratory directors, to join together to establish uniform testing procedures nationwide. With the ease in which milk now moves from state to state, variations in milkfat test results will become an even larger issue today than they have been in the past. Working towards this goal, I chaired a subcommittee under the Quality Assurance Task Force of the

#5

Calibration Samples - Weekly Averages
(average of 10 samples)

Week of	R.G.	Bab.	Mot.	Kjel.	Calc. Prot.	Calc. Lactose	Total Solids
1/3/84	4.27	4.30	4.27	3.31	3.37/ (3.45)	4.96	13.24
1/9/81	4.16	4.19	4.14	3.31	3.35/ (3.55)	4.90	13.08
1/16/84	4.39	4.41	4.41	3.43	3.42/ (3.59)	4.86	13.39
1/23/84	4.46	4.49	4.45	3.47	3.45/ (3.59)	4.86	13.48
1/30/84	4.47	4.50	4.44*	3.46	3.45/ 3.43	4.81	13.44
2/6/84	4.43	4.44	4.43	3.45	3.43	4.87	13.44
2/13/84	4.30	4.31	4.29	3.41	3.37	4.87	13.28
2/21/84	4.35	4.38	4.33	3.38	3.40	4.91	13.34
2/27/84	4.32	4.36	4.30	3.42	3.38	4.87	13.30
3/5/84	4.34	4.34	4.34	3.44	3.39	4.87	13.34
3/12/84	4.36	4.40	4.34	3.34	3.40	4.91	13.41

*Machine Recalibrated.

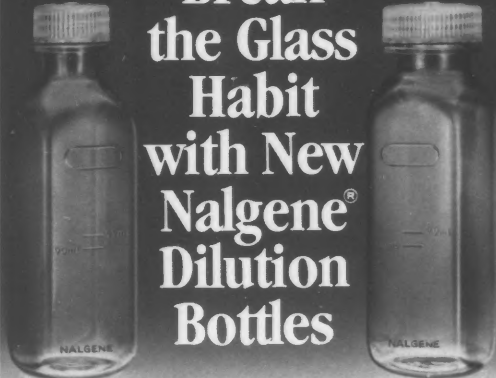
Northeast Dairy Practices Council in writing *Guidelines for Butterfat Determination of Various Dairy Products*, and I am currently the subcommittee chairman for a new guideline to be published by the Northeast Dairy Practices Council entitled *Controlling the Accuracy of Electronic Testing Instruments for Milk Components*. To clarify—I am not saying that these necessarily have to be the procedures that should be followed nationally. What I am saying is that these guidelines can be a basis for establishing uniform testing procedures to eliminate some of the large variations between milkfat test results

which have occurred in the past and continue to occur today.

I feel that the need for uniformity is even greater today than ever before, with the possibility that component testing and pricing may soon be a reality nationwide. In the May issue of the *National Dairy News*, Truman Graf, Marketing Specialist at the University of Wisconsin, projected that by next year (1985), most milk plants will pay producers a price that reflects other components of milk in addition to butterfat content. A group of dairy organizations will be presenting a proposal to the United States Department of Agricul-

ture's Dairy Division, requesting a public hearing to consider paying producers for solids-not-fat as well as for butterfat. This initial request is expected to cover Federal Orders Nos. 1 (New England Federal order), 2 (New York-New Jersey Federal order), and 4 (Middle Atlantic Federal order). So we, as lab directors, may be faced in the very, very near future with the testing for and calibrating of electronic instruments to protein and lactose, as well as butterfat.

The challenges are here and now. Are we ready to meet them?



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Tests To Determine The Safety of Cheeses

Presented at the Second Annual Meeting of the American Cheese Society, June 3-5, 1984.

Dick H. Kleyn

Department of Food Science
Rutgers University
Cook College
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New Brunswick, NJ 08903

All food products, including cheese, must be offered to the consumer as being safe, pure, wholesome, and of honest value. The food industry and the government have the responsibility of meeting these requirements, it being necessary for them to cooperate closely in this matter. Industry standards are often somewhat higher than required by the government, as they have their brand name(s) to protect in addition to being public-spirited. Only one foodborne outbreak may put a company out of business, whether it be due to the presence of harmful microorganisms or possible adulterants such as harmful toxic chemicals. J. A. Toby in Public Health Law (1947) made the following statement: "The rule is well established in American law that a vendor of food warrants that it is fit for human consumption, and is liable for damages if the food causes physical injury to the consumer."

Adulterants of Public Health Significance

The major adulterants of milk which may cause illness to man con-

sist of antibiotics, pesticides, and radionuclides. Antibiotics and pesticides gain entry into milk through improper use, while radionuclides result from a nuclear reaction, which hopefully will not occur. Regulatory agencies routinely monitor our milk supply for antibiotics, pesticide and radionuclide levels, while the dairy industry is also charged with monitoring antibiotic levels.

Antibiotics - The FDA has declared that antibiotics must not be present in foods, as they are considered to be unsafe substances. Some people are sensitive to penicillin G, with even low concentrations causing severe skin rash. In addition, the presence of antibiotics in milk to be used for the manufacture of fermented products, e.g., cheese, can result in the failure of cultures to produce acid through their inhibitory effect on their growth.

Antibiotics are routinely used in the treatment of dairy cattle for bacterial infections such as mastitis. Milk from cattle being treated with antibiotics must be withheld from the supply for a specified period of time so as to allow the drug to be eliminated from the milk, usually 48 to 72 hours. Unfortunately, due to neglect, failure to follow instructions, or purposeful sale of the adulterated product, antibiotics do find their way into our milk supply.

How may one determine the presence of antibiotics in milk? Presently, one of the routine methods used for confirming the presence of antibiotics in milk is the disc assay method utilizing *Bacillus subtilis*, the

test being based on the principle that bacterial growth is inhibited by antibiotics. A culture of this microorganism is mixed with nutrient agar, poured into a dish, covered, and allowed to solidify. A paper disc is then impregnated with a sample of milk and placed upon the inoculated, solidified agar. After incubating at a temperature suitable for growth of the microorganisms (37°C) a given period of time (3-4 hrs), the dish is inspected. If a zone of inhibition occurs around the disc, it is evidence that antibiotics are present. The size of the zone of inhibition reveals the level of antibiotic present.

Simpler and more rapid tests have been developed for detecting the presence of antibiotics in recent years, one example being the Charm test. This test is based upon the irreversible binding of antibiotics on the cell wall of *B. stearothermophilus*. ¹⁴C-labeled penicillin and bacterial binding sites are added to a milk sample. If penicillin is present in this milk, it will compete with the ¹⁴C penicillin for the bacterial binding sites. A penicillin analyzer then measures the amount of bound ¹⁴C penicillin—the higher the value, the lower the penicillin concentration. This test is a product of biochemical technology and may be administered in 15 minutes.

Pesticides - Our food supply would diminish greatly with a subsequent increase in food prices were it not for the use of pesticides in the production of crops. Unfortunately, these chemicals are usually harmful to humans as well as the pests. Con-

sequently, every effort must be made to prevent their entry into our food supply and to monitor the food supply routinely.

In January 1960, the first seizures of dairy products allegedly containing pesticides occurred, the products seized being evaporated milk and butter. Few seizures have occurred in recent years, but it should be remembered that products containing more than the established tolerances can be seized by the FDA.

Chromatographic techniques are used for the qualitative and quantitative analysis of pesticides in milk and milk products.

Radionuclides - Radioactive atoms are of concern because our body cells may be damaged by gamma rays or beta particles. The ingestion of feeds that bear fallout on their surfaces by cattle may result in contaminated milk. Strontium 90 and iodine 131 are the major radioactive substances of concern.

Methods have been developed for measuring the above radionuclides in milk by counting radioactive emissions. It should also be mentioned that processes are available for removing Strontium 90 and iodine 131 by passing milk over cation - and anion - exchange resins, respectively.

Pathogens of Public Health Significance

Man may become diseased by consuming milk products contaminated with disease-producing microorganisms. This occurs either through direct transmission from a diseased animal or indirect transmission, i.e., where a man afflicted with a disease contaminates the milk.

Direct Transmission - The most common diseases of cattle in the U.S. transmissible to man through milk are tuberculosis and brucellosis. Significant progress has been made in eliminating both of these diseases from cattle through efforts of the USDA. Well under 0.1% of the cattle in the U.S. are found to demonstrate a positive tuberculin test, and less than 0.5% of the dairy herds in the U.S. are found to demonstrate a

positive test for brucellosis. In addition to cattle—swine, sheep, and goats may also suffer from brucellosis.

Q fever may also be transmitted through raw milk, the causative microorganism being *Coxiella burnetii*. It is found in ticks, wild animals, cattle, sheep, and goats. Finally, *Listeria monocytogenes*, a microorganism causing bovine mastitis, has been isolated from raw milk where listeriosis occurred in dairy cattle and in man. This organism has also been isolated from pasteurized milk and from cheese.

Indirect Transmission - Milk and milk products may serve as a vehicle for the transmission of microorganisms which cause disease in man. As these microorganisms do not survive the pasteurization process, they obviously must be introduced by man after pasteurization, if found in a pasteurized product. Some of the more common diseases falling into this category include salmonellosis, staphylococcal food poisoning and scarlet fever.

Does pasteurization insure safety?
- Few, if any, foodborne disease outbreaks traced to the consumption of pasteurized fluid milk and milk products have been reported for several decades. However, it is my understanding that some deaths of infants and elderly people were traced to the consumption of pasteurized milk contaminated with *Listeria monocytogenes* last summer.

Pasteurization of milk and milk products is undoubtedly responsible for the extremely low incidence of foodborne disease outbreaks in the U.S. Nevertheless, there are still some people who are convinced that raw milk either tastes better or is more nutritious than pasteurized milk. In reality, the safety achieved by the pasteurization process far exceeds the slight loss of nutrients. There is concern for the promotion of raw milk consumption by food fadists, and it is predicted that an increase in milkborne epidemics will occur if the trend continues. This point is exemplified by the fact that

outbreaks of salmonellosis associated with milk increased from 8 to 20% between the periods of 1941/1948 and 1962/1972. Most of these outbreaks occurred on the farm or among consumers purchasing raw milk.

What about pasteurization regulations for cheese? - Federal Standards of Identity provide the following stipulations for cheeses that are involved in interstate commerce:

1. All unripened cheese must be made from milk pasteurized at not less than 145°F for at least 30 minutes, or for a time and at a temperature equivalent thereto in phosphatase destruction.

2. Ripened cheese, like unripened cheese, must be made from pasteurized milk or, if not, the cheese must be held for at least 60 days at a temperature of not less than 35°F.

3. Cheese itself may be pasteurized, as is processed cheese.

One of the advantages cited for cheese and other fermented foods is the presence of natural inhibitory substances which arise from the lactic acid fermentation, these substances acting to suppress disease producing bacteria. In addition, the safety of most ripened cheese is enhanced by virtue of its low moisture content, minimal air contact, and often the presence of salt at a high concentration. It is believed that many of the foodborne epidemics traced to ripened cheese made from raw milk could have been prevented if the lactic acid fermentation had been properly conducted.

Perhaps one should question why some cheeses are made from raw or heat-treated (unpasteurized) milk. Cheddar, Swiss, and Provolone are examples of cheese often made from such milks, based upon the belief that full flavor and body development can occur only if the milk is not exposed to the high temperature used in pasteurization.

While pasteurization of milk for cheese is a positive safety factor, it does not necessarily guarantee safety. Post — pasteurization contamination may occur, or the pasteurization process may have been conducted im-

properly. Hopefully, neither of these negative activities occur on a frequent basis in the U.S.

How can you tell if cheese has been made from pasteurized milk? - Raw milk contains enzymes which are referred to as organic catalysts. One of these enzymes, namely alkaline phosphatase, has been found to be present in all raw milk and to have a thermal resistance which is greater than that of any non-sporeforming pathogens which might be present in milk. Thus, tests have been developed to determine the effectiveness of the pasteurization process, or in the case of cheese, to determine if it has been made from raw or pasteurized milk.

Phosphatase tests used in the U.S. are based upon the principle that the alkaline phosphatase enzyme present in raw milk liberates phenol from a disodium phenyl phosphate substrate or phenolphthalein from a phenolphthalein monophosphate substrate, when the tests are conducted at a suitable temperature and pH. The amount of phenolphthalein or phenol liberated from the substrate is proportional to the activity of the enzyme. Phenol is measured colorimetrically after its reaction with 2,6-dichloroquinonechloroamide (CQC) to form indophenol blue. Phenolphthalein is detected by the addition of sodium

hydroxide. These tests are relatively simple and may be conducted on a routine basis by a laboratory technician.

It is interesting to note that a study conducted by the government several years ago revealed that 21 of 48 Cheddar cheeses labeled "pasteurized" and collected at random in grocery stores were, in fact, unpasteurized. The explanation for this observation lies in the fact that either the milk has not been adequately pasteurized, or the cheeses were intentionally mislabeled. Cheese manufacturers should be encouraged to conduct the phosphatase test on their finished product in order to verify that the milk used was indeed pasteurized.

Summary

The following statements summarize the major points in this presentation:

1. The consumer must be offered cheese which is safe, pure, wholesome, and of honest value;
2. The vendor is liable for damages if the food causes physical injury to the consumer;
3. Antibiotics, pesticides, and radionuclides are the major adulterants of milk which may cause illness, there being tests available to detect each of these adulterants;
4. Milk, the raw material used in

cheese manufacture, may contain disease producing microorganisms which gain entry either through direct transmission from a diseased animal, or indirect transmission by man, which usually is a result of post-pasteurization contamination.

5. Very few foodborne illnesses are traced to the consumption of pasteurized milk or milk products manufactured from pasteurized milk.

6. Cheeses made from raw or heat-treated milk are likely to be safe for consumption provided that the fermentation process occurred properly and that the cheese was ripened for a minimum of 60 days.

7. The alkaline phosphatase test may readily be used to determine if cheese has been manufactured from raw or pasteurized milk.

8. Cheese manufacturers should be encouraged to verify that the milk used in the manufacture of cheese was pasteurized if the cheese is to be so labeled.

REFERENCES

1. Campbell, J. R., and Robert T. Marshall. 1975. *The Science of Providing Milk for Man*. McGraw Hill, Inc.
2. Kosikowski, Frank. 1966. *Cheese and Fermented Milk Foods*.
3. Marth, E. H. 1978. *Standard Methods for the Examination of Dairy Products*, 14th Edition. APHA, Washington, D.C.

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Higher Milk Production With High-Moisture Shelled Corn

Milk production for the first 150 days of lactation was 3.2 pounds per cow higher for cows fed high-moisture shelled corn than for cows fed high-moisture ear corn, in a recent study done at the University of Minnesota's Northwest Experiment Station by animal scientist George D. Marx.

However, Marx says the late lactation results were the same for both the shelled and ear corn. For the entire lactation, cows on the shelled corn produced 1.9 pounds more milk per day.

The research was done with the high-producing registered Holstein herd at the Crookston station. There were 54 lactations completed during a two-year period, with half the cows on each treatment.

The high-moisture whole shelled corn was harvested with a corn head on a Massey Ferguson 410 combine. For the high-moisture ear corn, a two-row snapper head attachment was used on a New Holland 892 field chopper. A one-inch recutter screen was used in the field chopper to get the best particle size for ensiling and feeding.

Both types of corn were stored and preserved in Harvestore structures.

Ear corn in the study had all the cobs and husks. "This included minor amounts of trash like tops, tassels and leaves pulled into the snapper rolls during harvest," Marx says.

Other systems -- like a corn picker or combine designed to save the corn with part or most of the cob -- may give cleaner, higher quality high-moisture ear corn with less trash and no husks. This could result in higher milk production, Marx says.

"Both systems are practical," Marx says. In this study, there was a 23 percent yield advantage for high-moisture ear corn. But farmers harvesting shelled corn can go back and pick up the crop residue to make lower quality forage and increase yield potential.

AACC Announces Milling For Cereal Chemists Short Course

The American Association of Cereal Chemists (AACC) announces Milling For Cereal Chemists, scheduled for January 3-5, 1985 at Kansas State University, Manhattan, Kansas. The course is designed to provide cereal chemists with an in-depth view of the milling process, and the opportunity to work with milling equipment.

All major aspects of the milling process will be discussed and demonstrated, with the student observing, then performing the procedure.

Highlights of the course include tours of a flour mill, bakery, and flour treatment lab; discussions of raw materials, experimental milling, and flour mill operation; and hands-on experience with roll stands and sifters.

Registration fee for the Short Course is \$525.00 for AACC members, \$625.00 for non-members. A \$50.00 deposit is required to reserve space in the Short Course. Deadline for registration is December 12, 1984.

A registration form can be obtained by contacting Dotty Ginsburg, AACC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. 612-454-7250.

USNAC Needs Expertise of IAMFES Members

IAMFES is a member of the United States of America Committee of the International Dairy Federation (USNAC) and as such has the privilege of selecting members to serve on various USNAC/IDF Groups of Experts. A number of IAMFES members are now serving on various groups and do offer considerable advice to the operations of these groups. The USNAC Groups of Experts are similar to those in the IDF, and the Chairman automatically is made delegate to the IDF.

Work in these groups is both an enrichment to the individuals and gives them an opportunity to learn of both research and developments in many countries and, in addition, offers a distinct service to the U.S. dairy industry.

Travel is not required since all of the activities are accomplished by correspondence. During the year, questionnaires, circulars, proposed publications and standards, and other documents are sent to members of various groups for their expert opinion.

These opinions are then correlated and sent to IDF headquarters in Brussels as the USA viewpoint. The following groups are in need of IAMFES members:

A14 Measurement of mechanical milking practice in relation to environmental factors affecting the efficiency of milk production.

A19 Spores in raw milk.

B15 Recombination of milk and milk products technology and engineering aspects.

B18 Control of water and waste in the dairy industry.

B24 Air pollution in the dairy.

B29 Corrosion in dairying.

B30 Flow meters and sampling equipment.

B32 Control systems for automated processes.

D9 Labeling of dairy products.

E44 Identification and enumeration of characteristic microorganisms in fermented milks.

F19 Indigenous antibiotic and bacteriostatic systems in milk.

For additional information on the activities of USNAC and IDF, refer to Dairy and Food Sanitation Vol. 4, No. 4, pages 133-137 (April 1984). To those members who are interested in serving with these Groups of Experts, please write to Harold Wainess, who is the IAMFES representative to the International Dairy Federation and also Secretary of USNAC, at Harold Wainess & Associates, 464 Central Avenue, Northfield, IL 60093.

ABC-TV Airs First Network Dairy Promotion Commercials

The National Dairy Promotion and Research Board's nationwide ad campaign to increase consumption of dairy products kicked off officially on the evening of Sunday, September 9, when the first two national network dairy commercials aired.

These were the first of 703 National Dairy Board-sponsored milk and cheese commercials due to appear on the three networks between September 9 and April 30, the close of the campaign.

An average of 26.5 National Dairy Board commercials will appear each week. Of the total viewing audience, fluid milk ads will reach 85 percent an average of 3.8 times; cheese promotion commercials will reach 88 percent an average of 7.2 times; and cheese continuity ads will reach 90 percent an average of 6.7 times.

Of the 703 national network commercials, at least 261 will appear during prime-time hours (8:00-11:00 p.m.). Three hundred forty-six will appear on daytime TV. Ninety-six commercials will be aired during children's shows, including a number of prime-time specials.

For the sporting audience, fluid milk commercials will run during Games One and Three of the World Series, and cheese ads during Games Two and Four. Ads will also air during next year's Superbowl XIX.

Not included in the network schedule are butter ads, for which time is still being bought. Butter ads, in addition, will be dropped into selected regional markets rather than appear nationwide. The Board's calcium-related ads will be carried in the print media, not on television.

The National Dairy Board commercials are supplemented and complemented by ads sponsored by the state and regional promotional bodies, whose ads appear in their own markets only.

The national advertising campaign was designed by the Dairy Promotion Federation Association, which won a \$50.6 million contract from the National Dairy Board to carry out the promotion work. The Federation is composed of the United Dairy Industry Association and the promotional bodies of California, Oregon, Washington and Nevada (known as COW).

The National Dairy Promotion and Research Board was established by Act of Congress to develop a coordinated program of promotion designed to strengthen the dairy industry's position in the marketplace and to maintain and expand domestic and foreign markets and uses for fluid milk and dairy products.

This national program of promotion, research and nutrition education is financed by a mandatory 15-cent per hundred-weight assessment on all milk produced and marketed in the contiguous 48 states. The 36-member policy-making board of dairy producers was appointed by Agriculture Secretary John Block.

Food Engineering Award Nominations Open

Nominations for the 1985 Food Engineering Award are now being accepted by Dairy and Food Industries Supply Association and American Society of Agricultural Engineers, sponsors of the award. Deadline for nominations is January 15, 1985.

The award is presented biennially for original contributions in research, development, design, or management of food processing equipment, or for techniques having significant economic value to the food industry and the public. The award consists of a gold medal, certificate and \$2,000 cash stipend.

Candidates will be evaluated for human performance and progress in food engineering and technology, development of machines, processes or methods for the food industry, and leadership in the professional development of the food industry.

Nominations should include a 500-word statement describing the nominee's achievements and recognition in the food industry. The essay should cover: How the award criteria was met; professional and business history; published works; educational background and organizational memberships.

Nomination may be made in letter form or on the official form, available from James L. Butt, ASAE Executive Secretary, 2959 Niles Road, St. Joseph, MI 49085.

New Product News

The products included herein are not necessarily endorsed by Dairy and Food Sanitation.

Anacon MDR-7: Exact and Automatic

• At Anacon we've taken refractometry into the next generation. No more dependence on operator technique or sample characteristics for repeatable measurements. The Anacon MDR-7 measures exact concentrations of dissolved solids, acids, solvents and other liquids automatically, accurately, repeatably . . . over and over and over again. There is no need to focus, adjust shadow line, or visually interpolate results. The MDR-7 does it all automatically. Instant, direct readouts in refractive index, °Brix, and compensated °Brix. Simply place the sample of dissolved solid or liquid in the prism . . . and the measurement is read out directly on the large, bright LED display. Unlike conventional Abbe refractometers, the Anacon MDR-7 is unaffected by foam, suspended solids, color or opacity. The MDR-7 determines concentrations even when there is no distinct shadow line.

The Anacon MDR-7 Refractometer is a critical angle refractometer which measures the refractive index of a solution at the interface of the liquid and prism. A light beam is directed through a prism to the interface of the prism surface and the sample liquid. The light rays at this interface are at angles above and below the critical angle. The critical angle is the angle from the perpendicular at which the light ray changes from being transmitted into the sample liquid to being reflected at the interface.

A solid state light emitting diode (LED) serves as a light source which forms a conical shaped beam which impinges upon the face of the prism. The critical angle is dependent upon the refractive index of the sample liquid resting upon this interface surface. As samples of different refractive index are placed upon this interface, the critical angle changes. All of the light impinging upon the interface surface at an angle of incidence less than the critical angle will pass directly out of the prism into the sample liquid and be lost. All of the light at an angle of incidence greater than the critical angle will be reflected from the prism surface. That portion of the light beam that does not pass into the sample is reflected back into the prism which acts as a mirror reflecting the light beam back to the detector; thus the light beam leaving the prism is identical to the light beam entering the prism except that a portion has been lost. As sample material changes, the critical angle changes. The MDR-7 "sees" a shadow edge; its placement is directly related to the sample's refractive index value.

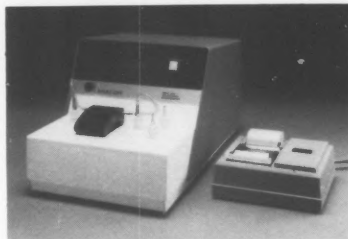
There is no depth required of the sample liquid. Consequently, the instrument is not affected by gas bubbles, color, or undissolved foreign matter (particulates) present in the sample. The instrument responds only to dissolved solids.

The refractometer uses a microprocessor to compute the refractive index. A front-panel

LED display with decimal point is then used to display either refractive index, °Brix, compensated °Brix to 20.0°C or temperature in degrees Centigrade. In addition, the refractometer has a 110 BAUD 20mA current loop serial output suitable for connection to a printer or computer.

Further information on the Anacon MDR-7 Refractometer can be obtained from Anacon, F.C. Box 416, South Bedford St., Burlington, MA 01803. 617-272-9002/617-272-0765 or Telex 951733.

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The Anacon MDR-7

New Immobilized Enzyme Technology

• Every day, the nation's cheesemaking industry produces millions of pounds of cheese, and millions of gallons of whey permeate that present a serious disposal problem due to its high biological oxygen requirement.

Now, a new system has been developed that allows the lactose in ultrafiltered whey and milk permeate to be converted to glucose and galactose, which can be used as a high value sweetener or fermentation substrate.

The system is called the DAMRACE™ hydrolysis system and was developed jointly by Damrow Company, a division of DEC International, Inc., and the Microporous Products Division of Amerace Corporation.

The DAMRACE system is the first commercial application derived from Amerace's unique immobilized enzyme technology. DAMRACE is a continuous flow-through immobilized enzyme reactor system. It hydrolyzes lactose in whey and milk permeate to produce a high value sweetener that can replace sucrose and various corn syrups in dairy and food products. The system can also convert whey and milk permeate to a fermentation substrate which can be concentrated to a syrup or dried to a powder.

At the heart of the new system is a unique, microporous PVC-silica sheet (MPS® sheet) developed and manufactured by Amerace for continuous catalytic reactions. Although development work with MPS sheeting until now

has been with immobilized enzymes, it is not limited to enzymes and could have broad application in other areas ranging from food processing to chemical industries.

"Basically, our system gives cheesemakers an opportunity to convert a waste product into a high value product faster and more economically than any other system available," said George Manninen, president of Damrow. "It could really open up new markets for the cheese industry."

Manninen said his firm has entered into a licensing agreement with Amerace to manufacture and market processing systems that use Amerace's Microporous Products Division's unique, hydrolytic immobilized enzyme technology. The agreement gives Damrow North American and European marketing rights for systems incorporating the new technology, Manninen said.

Bruce Goldberg, Business Manager and Technical Director of Enzyme Venture for Amerace's Microporous Products Division, said the DAMRACE reactor consists of modules made from porous plastic sheets which contain silica. A patented process bonds the enzyme lactase to a multitude of silica particles in the sheet. This process effectively immobilizes the enzyme, allowing it to be used over and over again, he said.

"When the whey or milk permeate passes through the reactor, intimate contact is quickly achieved, producing a high reaction rate and excellent productivity," Goldberg said. "Using this process, all the solids in the original milk for cheesemaking can now be used as a replacement sweetener in products ranging from ice cream to yogurt, or as a fermentation medium for products that include alcohol and yeast."

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New Brochure On Ratioflo Proportioning Meters

• A comprehensive brochure on Ratioflo Proportioning Meters has been issued by Union Kol-Flo Corporation. The four page brochure is amply illustrated with product photos—including application data on continuous proportioning, automatic batching, dispensing and filling.

The brochure describes the Ratioflo meter as "a very simple and extremely accurate approach to measuring liquids," available in five models and flows to 75 GPM. It includes customer benefits, product features, and specifications.

For free copies of the brochure, write or call Dale Tanner, Union Kol-Flo Corp., Ratioflo Products Group, 320 N. Jensen Rd., Vestal, NY 13850. 607-729-9225.

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Food Science Facts

For The Sanitarian



Robert B. Gravani
Cornell University
Ithaca, NY

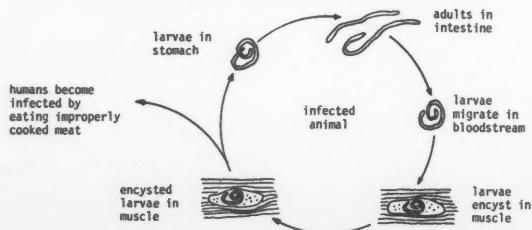
PARASITIC FOODBORNE DISEASE

Parasites are organisms that depend on a living host to provide nutrients. There are several parasites that can live in animals used for food and cause foodborne disease in humans. According to the Center of Disease Control, parasites were responsible for approximately 7.6% of the confirmed foodborne disease outbreaks between 1975-79. Although parasites are not responsible for a great number of outbreaks, knowledgeable food industry employees can prevent parasitic foodborne disease.

TRICHINOSIS

Probably the best known and most significant foodborne parasite is the delicate, threadlike roundworm, *Trichinella spiralis*, which causes Trichinosis in humans. This parasite is found around the world in pigs, bears, rats, dogs, cats, and other domestic and wild animals. Among the meat-producing animals, pigs are the greatest single source of Trichinosis in humans. The life cycle of *Trichinella spiralis* is quite simple. A pig eats scraps of meat from an infected animal that harbors the live worm in its muscles. After slaughter, the infected and inadequately cooked pork is consumed by a person. The *Trichinella* larvae, which are protected by a capsular cyst, are released and mature in the stomach in 5-7 days. The adult worms then invade the lining of the small intestine where they reproduce. The new offspring enter the bloodstream of the person and are carried to all parts of the body. They then penetrate the muscles, form cysts and remain alive and infective for months. The life cycle is completed when another animal eats the muscle(s) containing the live *Trichinella spiralis* larvae.

The life cycle of *Trichinella spiralis* is shown below.



The disease

The symptoms of trichinosis usually appear 9 days after eating the infected meat, but this time can vary from 2-28 days. The symptoms also vary with the number of larvae eaten. The first symptoms - nausea, vomiting and diarrhea, are often confused with bacterial food poisoning and appear when the trichinae invade the intestines. These symptoms are followed by fever, swelling of the eyelids, sweating, weakness and muscular pain when the larvae migrate into the muscles. Death may occur in severe cases.

Prevention and control

Trichinosis can be prevented in several ways:

(1) Prevent contamination. Prevent meat from becoming contaminated on the farm by cooking all garbage fed to hogs and by controlling rats and mice.

(2) Destroy trichinae present in meat. This can be accomplished by:

- Thorough cooking - All pork should be cooked so that every part of the meat reaches a temperature of 150°F. The National Pork Producers Council recommends that pork roasts be cooked to an internal temperature of 170°F. Recent USDA information recommends that pork should be cooked to an internal temperature of 170°F when microwave ovens are used. This information encourages microwave cooks to: (a) rotate dishes during cooking; (b) let the pork sit for several minutes after cooking as recommended by microwave oven manufacturers to assure more uniform temperature distribution.
- Freezing - Freezing pork at certain temperatures for specified periods of time will also kill trichinae as shown in the table below:

Storage Time and Temperatures Required for the Destruction of *Trichinella spiralis*

Freezer Temp. °F	Days of Storage Required	
	Pork 6'' or less thick	Pork 6'' to 27'' thick
5	20	30
-10	10	20
-20	6	12

• Processing pork sausage and related products according to USDA recommended procedures of salting, drying, heating, smoking and refrigeration.

(3) Avoid cross contamination of raw pork with other meat products.

OTHER FOODBORNE PARASITES

Other types of foodborne parasites include beef, pork and fish tapeworms. These tapeworms may cause disease in humans when larvae infested meat is eaten. The diseases can occur when human wastes contaminate fresh water streams and lakes, animal pastures or feed. These parasitic diseases occur infrequently, due to good sanitation, proper sewage disposal and thorough cooking procedures.

Anisakis is a roundworm contaminant of fish that can cause human illness if infected fish are eaten raw or are inadequately cooked. Prevention is by freezing at -4°F for 24 hours or by thorough cooking of the fish.

By following these principles of good sanitation, proper storage and thorough cooking, parasitic foodborne disease can be prevented.



N.M.C.

NATIONAL MASTITIS COUNCIL

By Steve Watrin
Rep Training Specialist
Land O'Lakes, Inc.

Rapid Penicillin Tests Comparison

A well accepted management practice today is to treat all cows showing clinical mastitis with antibiotics. When antibiotics are used, the dairyman is responsible for making sure the antibiotic is cleared from the milk before selling it. With today's economics, the dairyman may want to improve his losses by investing in one of the many rapid penicillin tests.

In the next few months we will review five different tests now being used by dairy operations and dairymen. We will look at chemistry, present status, advantages and disadvantages of each test. This month we will cover the Stearothermophiles Disc assay test.

Bacillus Stearothermophiles Disc Assay

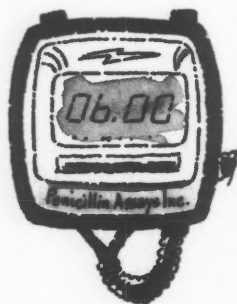
The test checks for inhibition of bacteria impregnated in agar medium. A positive reaction is the lack of growth around a disc, which gives the appearance of a clear zone. The agar medium may also have dye added which will result in both a clear zone and lack of color change on any positive reaction. Currently this test is used in most dairy operations and on some farms. It is the official test for penicillins (beta-lactams) in fluid milk. One great advantage of this test is that it carries official sanctions. In addition, the test will detect all penicillins (beta-lactams). It is easy to use and can be quantitative with a sensitivity of 0.005 units penicillin. It is applicable to laboratory, field and farm use with moderate to low capital investment. However, it takes two to three hours for test completion. Also, the test requires a supply of standardized agar plates which must be made up with correct amounts of bacteria and agar.

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But you may not realize that you can now catch contaminated milk right where it gets contaminated. With the new Charm Field Test.[™] You can take it anywhere. And



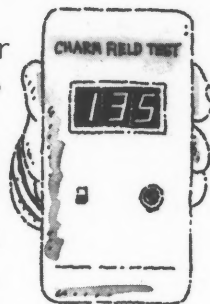
In under 6 minutes you'll be 100% sure.

get 100% accuracy, in under six minutes.

And not only does it all fit into a little case that goes anywhere there is milk. It's also simple enough to be used by anyone who handles milk. Like a producer at a milk barn. A trucker at a tanker. A fieldman at his car. An attendant at a pump-over station. Even a processor at a plant.

You see, all it takes to run our Field Test is an ability to read numbers. Because the result comes out on a digital reader. And it becomes a permanent record if you need one.

What's more, our Field Test can test two samples at one time. And it takes only one minute working time each. After which you can walk away from it.



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And the Charm Test doesn't just catch Penicillin G and Cephalosporin. It catches the whole family of penicillin beta lactams, all 33 that can make for contaminated milk. All with a single test.

Add to all that the fact that our Field Test costs only \$1.50 and has reagents that are incredibly stable (meaning you can use them until they're gone), and you'll see it not only makes sense to use a Charm. It's downright foolish to be caught without one.



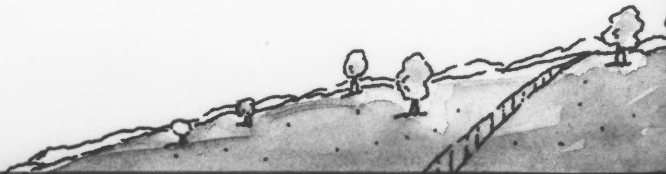
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PRESIDENTIAL ADDRESS

71st Annual Meeting

*International Association of Milk, Food & Environmental Sanitarians, Inc.
Edmonton, Alberta, Canada*

A. RICHARD BRAZIS

*1006 Martin Drive-West
Bellevue, Nebraska 68005*

Welcome to the 71st Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, or IAMFES, if you prefer a short name. This year we are privileged to have our Annual Meeting in Edmonton, Alberta, Canada, one of the two "gateways" to Alberta's Canadian Rocky Mountains and the Canadian Northland. This is the second meeting in Canada during the past 9 years; it is nice to have an IAMFES Annual Meeting, at least every 10 years, with one of our International Affiliates.

The IAMFES Program Committee, and in particular, Program Chairperson Archie Holliday, and the Alberta Affiliate Local Arrangements Committee, Chaired by Don Paradis, have been very busy for 3 years, and as a result, have developed a comprehensive educational and entertainment program for this year. This is the first time that our educational program has included two symposia, in addition to the general sessions and the Milk and Food Sanitation split-sessions. You may participate and communicate at the symposium and/or split session of your choice.

THE IAMFES OFFICE AT AMES, IOWA

This past year has been a transitional period for the Executive Board, the Affiliates, Committees, Membership, Journal Management, related organizations and the Ames IAMFES Office. The transition that has taken place, Kathy Hathaway replacing retired Earl Wright as Executive Secretary, has been very smooth. The reasons for this are the excellent cooperation, assistance and communications that have existed during the year between the Executive Secretary and the entire Executive Board, the Affiliates and other component activities of this Association. Kathy Hathaway and her capable staff at the Ames Office have worked diligently on all phases of IAMFES management, marketing and office duties which interface directly, and sometimes indirectly, with all segments of the IAMFES membership. Another reason for the smooth transition was the need for the Executive Board to become more knowledgeable in the operations conducted at the Ames Office by working more closely with Kathy during this first year. Although Kathy possesses exceptional marketing, publication and office skills, her sanitation

and scientific background was limited. The close relationship between Kathy and the Executive Board this year provided the opportunity for members of the Board to furnish assistance when necessary. After 1 year as Executive Secretary, Kathy Hathaway is much more comfortable in handling requests for sanitation information from the membership and from related organizations.

The Ames Office now has two Apple Computers, plus the necessary software, which are used daily and have resulted in saving a considerable amount of time and expense through their effective use.

Fluctuations in the number of members who inadvertently forget to renew their memberships on time each year is a continuing problem. The Ames Office has developed a number of novel approaches to remind, stimulate and motivate both members who renew their membership on time, as well as those who wait beyond the normal renewal date; many of the approaches have been successful.

As part of her communications program, Kathy Hathaway monthly sends to each member of the IAMFES Executive Board a list of activities which have occurred in the Ames Office, plus a Profit and Loss Statement. With this information available to all members of the Executive Board, there is increased familiarity with pertinent IAMFES business matters at the Ames Office as well as recognition of those areas of the financial operations which fluctuate during the year.

PERSONAL OBSERVATIONS

During my 5 years on the Executive Board, there has been a concern about the number of members who vote on matters pertaining to the affairs of our Association. An example of this is the less than 20% vote for the new Secretary/Treasurer each year. This year, however, the number of returned ballots was double that of previous years. Please exercise your voting privilege whenever this opportunity arises in the future.

Last January, the President's Perspective Page in both IAMFES Publications discussed the need for a projected change in the dues structure. Such a change would result in *Dairy and Food Sanitation* becoming the official "organ" of this Association. The current "organ," of

course, is the *Journal of Food Protection*, as stated in the IAMFES by-laws. This proposed change in the by-laws will be voted on at the business session at the Annual Meeting. The Executive Board believes that this change is necessary, and other members of the IAMFES family have indicated their approval. Currently, Association News, the list of the 3-A Symbol Holders, 3-A Standards, marketing ideas for increasing membership, and Affiliate News appear in both monthly publications of the Association. In a given year, this may require as many as 80 pages to publish this material. It is essential that all members be aware of what is happening in their Association, and, because all members do not receive both publications, information is repeated in both publications. The extra pages required has resulted in corresponding increases in operating costs for both publications. By changing the official "organ" in the by-laws -- Association News, information about related organizations, the list of 3-A Symbol Holders and the 3-A Standards can appear in one publication. At the same time, by making more pages available to the Editor of the *Journal of Food Protection*, research papers will be published in a reasonable time.

Approximately 1 year ago when I became President, I was determined to meet the needs of the membership. Unfortunately, it was really difficult to determine the composition of the membership and the needs that existed for the major groups of members. There were some figures available on membership composition, but the data were at least 10 years old. Based on the groups of members at last year's Annual Meeting, it was felt that the percentage of persons in the various groups of the membership had changed. The Executive Secretary was requested to poll the membership and request information on the job status and responsibilities of members. As of 2 weeks ago, the Ames Office had received approximately 900 replies from almost 2100 requests sent to members. Although the limited number of replies may not be representative of the total membership, it does represent the best information that could be obtained using conventional methods. The data received indicate that the following percentages of major groupings exist among members of the Association: (a) *industry*, 53%; (b) *government*, 30%; (c) *academia*, 17%. These numbers may not surprise you, although I would have guessed that a greater percentage of the membership consisted of personnel from Colleges and Universities. In any event, however, to better define the composition of the membership, these three groups were expanded to seven groups, and the job responsibilities were indicated for those who responded: (a) *milk and/or food quality control*, 33%; (b) *general sanitarians*, 21%; (c) *managers*, 16%; (d) *laboratory*, 16%; (e) *industry*, 7%; (f) *teaching and research*, 5%; and (g) *sales*, 2%. There are many other ways of classifying responsibilities of members from the data received, but the listing which was used seems to have served the purpose for which the membership poll was intended. The distinction between managers, laboratory, industry, teaching and research, and sales personnel is

quite clear. On the other hand, it would not be unusual to find plant personnel who were responsible for sanitation and quality control problems. The needs of these two groups were considered to have high priority, but not without regard for the other groups.

The Annual Meeting educational programs and our two monthly publications are, in fact, meeting the needs of the majority of the membership; 86% of the responding members are daily involved in jobs such as milk and/or quality control or quality assurance, managing, general sanitation and laboratory work. This year's annual program has been organized to include additional symposia and milk and food sanitation subjects to attract and be of interest to the broad diversity of our membership. At the request of the *Journal of Food Protection Management Committee*, an Advisory Committee on Annual Program Scientific Content was appointed to assist the IAMFES Program Committee in developing the program to include subjects having current scientific interest and speakers able to discuss these subjects. Such input from this Committee should result in more research workers who will become members of our Association and participate at our Annual Meetings. In fact, it is my understanding that necessary documentation is being collected at this meeting to inform the Executive Board and all interested parties as to the job responsibilities of persons who have registered as members.

MEMBERSHIP

Figures available from the Ames Office indicate that the membership has dropped almost every year since 1979, when there were 3,795 members and subscribers. This number dropped to 3,625 in 1981 and to 3,520 in 1982. In 1983 there was a decrease of 84 members. In 1984, the membership dropped only 35 members.

The members can be the best salespersons to reverse this trend in numbers of members and bring new members into the Association or bring back the old ones who have not renewed for one reason or another. Possible causes of past decreases could be attributed to the past and present inflation, early retirements and unknown reasons. Many of you have at great expense attended this Annual Meeting in Edmonton, Canada, and the Executive Board is aware of this. The Ames Office, and Kathy Hathaway in particular, has been promoting new memberships and membership renewals, but you are in the front working lines and can *attract* and *sell* the importance and value of IAMFES membership to prospective new members. Many co-workers and others that you come into contact with daily need to be affiliated and identified with an organization which supports and works to improve the professionalism of sanitarians. A goal of 4,000 members in our Association can be attained, but it will take stimulation and motivation by the Membership Committee and all active members to achieve this objective. If you think that you will have a need for promotional materials, or if you determine that the presence of the Executive Secretary, the President, or some

other member of the Executive Board can be of help to you at your Affiliate Annual Meetings, please advise the Ames Office.

AWARDS

At the 1983 Annual Meeting in St. Louis, the *Sanitarian's Award* was not presented. This award is an important document of recognition for a sanitarian who is a member of IAMFES. Presentation of the Award is based on a record of actions and accomplishments which are identified with the performance of a deserving member.

The Awards Committee cannot fulfill its responsibility when nominations of members are *not* received. To encourage more nominees for all Awards, the size of the Awards Committee was increased. This resulted in formation of separate subcommittees for certain awards, which include the *Educator Award*, the *Barnum Industry Award*, and the *Sanitarian's Award*. The nomination and supporting data forms for all Awards were reviewed and simplified to encourage more nominations. If insufficient nominations are received, no matter what the cause, the subcommittee chairpersons will work with their committees to seek out deserving individuals and attempt to obtain the necessary supporting documentation for consideration by the committee. Next year, the Awards Chairperson for the Annual Meeting at Nashville, Tennessee, will look forward to receiving many nominations for all awards from the membership. Don't be afraid to nominate a person because in the past the Awards Committee failed to recognize your nominee because of stiff competition.

FINANCES

The financial condition of IAMFES has greatly improved during the past 2 years, mostly as the result of streamlining the daily operations at the Ames Office and increased marketing successes to increase the number of advertisers in our publications and in the Membership Directory. A reasonable increase in the membership plus increased emphasis on marketing by the staff at the Ames Office will continue to keep our financial operations under control and in the black. Your Association has been successful in reducing the costs of operations to minimal levels and at the same time maintaining a positive flow of income, despite the inflationary effects we have observed for several years. As an example -- although the IAMFES annual income has increased from approximately \$170,000 in 1979 to \$300,000 in 1984, our costs have also increased from \$170,000 to \$260,000 during the same time.

COMMITTEES

Past-President Marshall developed a program which resulted in increased awareness of the importance of IAMFES Committees. This past year, a liaison with all committees was assigned to the Second Vice-President.

By maintaining contact with the committee chairpersons during the year, the Executive Board has been able to keep informed as to projected actions and needs of each committee. This form of continuing liaison with all committees should result in increased cooperation and improved exchanges of information with the Executive Board.

PUBLICATIONS

The Executive Board is quite enthusiastic about the positive responses that we have heard from the membership regarding increased acceptance of *Dairy and Food Sanitation*, now in its fourth year of publication. The new design on the front cover has also been well received. The *Journal of Food Protection* continues to be held in high regard by research workers and research organizations.

CONSTITUTION AND BY-LAWS

It has been a number of years since the constitution and by-laws have been brought up-to-date. Past-President Marshall accepted the responsibility of revising these documents and has been assisted by Secretary/Treasurer Leon Townsend. They have completed a commendable job on restructuring both documents to reflect the current professional status of IAMFES. Major changes appeared in the June issues of both IAMFES Publications; the changes will be explained and a vote will be taken for each document, at the business session of the Annual Meeting. Proposed changes in the constitution, which are approved by a majority vote, will be submitted to the entire membership of IAMFES within 90 days after the Annual Meeting.

THE FUTURE

It is my pleasure to inform you that the new IAMFES Secretary/Treasurer, as of the banquet on Wednesday night, will be Dr. Bob Gravani, from Cornell University. We look forward to his participation on the Executive Board.

No President of IAMFES is able to accomplish in 1 year the things he or she feels are important to the Association. I am pleased with the accomplishments that have occurred this year and during my tenure as an officer on the Board of Directors. The financial situation has greatly improved and the Ames Office has the type of leadership so essential to the future of our organization. Past and present Executive Boards have set a mark for future Boards to follow.

I encourage you, the membership, to continue your strong support of IAMFES in the years ahead. It may seem, from time to time, that one category or another of the membership is being favored, but remember that the IAMFES membership is diversified, as discussed earlier, and that changes in the composition of the membership may also occur. The important thing to remember

though is that IAMFES is an Association that represents and pursues the goals and interests of sanitarians, whether they be industry, government or academia. Your President and Executive Board are dedicated to that purpose.

Thank you for the opportunity of serving you as President during the past year, and my thanks to the Executive Board and the Executive Secretary for their assistance and cooperation this past year. I look forward to my remaining time on the Executive Board for the purpose of serving the Association to the best of my ability. I know that you will continue to support President-Elect Archie Holliday when he becomes the new President of IAMFES on Wednesday night, at the banquet. I also wish to thank Harry Jackson, President of the Alberta Association of Milk, Food and Environmental Sanitarians, and Don Paradis, Chairperson of the Local Arrangements Committee, and all members of that Committee, for their excellent cooperation and effort which will make all IAMFES members present at this 71st Annual Meeting remember the outstanding educational and entertainment program during the years to come.



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Left to right, Past President A. Richard Brazis, Affiliate Council Chairperson Helene Uhlman, and President Archie Holliday.

71st Annual Meeting Report



The garden in the Edmonton Inn.



Registration Desk.



Executive Board Meeting.



IAMFES Business Meeting.

The 71st Annual Meeting was held August 5-9, 1984 at the Edmonton Inn, Edmonton, Alberta.

A strong program, excellent facilities, as well as entertaining social events led to a very successful meeting.

The entire Local Arrangements Committee, chaired by Don Paradis, is to be congratulated, along with... Vice Chairman, Lawrence Roth; Finance, Lawrence Roth, Chairman; Facilities, Glen Evoy, Chairman; Audio Visual, Stan Schurman, Coordinator; Social Program, James Steele, Chairman; Companion's Program, Karen Erin, Chairperson, Barbara Roth, Coordinator, Eileen Kadis, Coordinator, Ing Wong, Corsages; Transportation, Jim Laws, Coordinator; Door Prizes, Bill Kadis, Coordinator; Registration, Peggy Marce, Chairperson, Lawrence McKnight, Coordinator; Publicity, Thelma Ketler, Coordinator; Printing, Lyndon Davies, Coordinator, Dan Pituskin, Signs; Symposia Program, Michael Stiles, Coordinator, David Schroder, Coordinator, Cherise Foster, Coordinator; Murray Fierheller, Photographer.

Charter buses on Monday took the group to Fort Edmonton Park for an enjoyable evening of food and spirits. A downpour of rain added a real positive flair of fun to the festivities.

Many companion activities were also offered during the 4 day conference, including shopping at the West Edmonton Mall, a tour of the Alberta Wildlife Park, and a demonstration on cooking with Kahlua.

Two Canadian Royal Mounties, along with a piper, led the head table in for seating at the Annual Awards Banquet. Awards, a superb dinner and entertainment by a steel band made an enjoyable evening for all.

The 72nd IAMFES Annual Meeting will be held at the Hyatt Regency in Nashville, TN, August 4-8, 1985. Chairperson of Local Arrangements for the 72nd Annual Meeting is Ruth Fuqua.

Be sure to nominate deserving colleagues for the prestigious IAMFES Awards this year. Information on nominating may be obtained from the IAMFES office in Ames.

A detailed account of the 71st Annual Meeting follows...



Henry Atherton, VT; Amber Nordine, IA; and Bill Arledge, KY visit between sessions.



IAMFES Past Presidents join afternoon session of the Executive Board.



Clair Gothard, TX; Ruth Fuqua, TN; and Don Rollins, MO enjoy the banquet.



IAMFES Executive Board - front row, l to r, Leon Townsend, Dr. Robert Marshall, Dr. Robert Gravani. Back row, l to r, Roy Ginn, Archie Holliday, Sid Barnard and Dr. A. Richard Brazis. Not pictured, Helene Uhlman, Affiliate Council Chairperson.

The Executive Board of IAMFES met at the Edmonton Inn, Edmonton, Alberta, Canada, August 5-9, 1984.

President A. Richard Brazis called the meeting to order Sunday, August 5 at 1:30 p.m. Board members present were: A. Richard Brazis, Archie C. Holliday, Sidney Barnard, Roy Ginn, Leon Townsend, Robert Marshall and Helene Uhlman. Others attending were Kathy Hathaway, Elmer Marth and Earl O. Wright.

Don Paradis, Chairman, Local Arrangements Committee, gave a report on pre-registration (which indicated over 300 had registered) and reviewed social functions planned for the meeting. Also, Paradis indicated a Past Presidents dinner will be held for the first time.

Barnard made a motion, seconded by Ginn, that the minutes of the previous meeting be approved as distributed. Motion passed.

Hathaway reviewed the auditors report for FY 84 which indicated excess of revenue over expenses to be \$43,016. Current Assets are \$145,531 and Fixed Assets are \$17,746, for Total Assets of \$156,427, as opposed to \$110,406 last year. Uhlman made a motion, seconded by Barnard, that the report be accepted. Motion passed.

Hathaway submitted and reviewed the Executive Secretary report. The report covered:

- a. Membership
- b. Publications
- c. Marketing
- d. Personnel Changes
- e. Equipment Purchases
- f. New Office
- g. Efficiency of IAMFES Office/Printing Office Relationship
- h. Travel
- i. Prospects of New Affiliates
- j. Insurance
- k. Exhibits
- l. Goals
- m. Nominations for Secretary-Treasurer
- n. Awards
- o. Executive Manager Contract
- p. Program.

Board actions on specific parts of the Executive Secretary's Report included:

1. Townsend made a motion, seconded by Ginn, that guidelines for exhibits prepared by Hathaway be accepted and exhibits be allowed at the 86 meeting on a trial basis. Motion passed.

2. Marshall made a motion, seconded by Barnard, to accept Hathaway's recommendations for deadlines of nominations for Secretary-Treasurer. Motion passed.

3. Marshall made a motion, seconded by Ginn, to accept Hathaway's guidelines for deadlines for persons on program including abstracts and highlights to be printed in *Dairy and Food Sanitation* (DFS). Motion passed.

4. Ginn made a motion, seconded by Barnard, that Hathaway be retained as Executive Secretary (Manager) for another year. Details will be worked out at the fall board meeting. Motion passed.

Uhlman made a motion, seconded by Barnard, to accept the Executive Secretary's report. Motion passed.

Hathaway previewed a slide/tape presentation outlining operation of IAMFES office. This presentation will be available at affiliate meetings.

Marshall reviewed proposed changes in Constitution and By-Laws. After considerable discussion, Ginn made a motion, seconded by Barnard, that Section 4D be deleted and that duties E, F, G and H of Ar-

icle III, Section 1 shall be assumed by the President in the absence of an Executive Manager and indicated in Article II, Section 1. Motion passed.

Marth reviewed a handout showing membership as compared to American Dairy Science Association and Institute of Food Technology, which revealed opportunities for expanded International membership.

Erwin Gadd, Chairman, Nominating Committee, reported that Robert Gravani, Cornell University, was elected Secretary-Treasurer. Marshall made a motion, seconded by Townsend, that Ginn's report be accepted. Motion passed.

Hathaway presented and reviewed the Proposed Budget for FY 84-85 which showed proposed income over expenses at \$28,250. Townsend made a motion, seconded by Uhlman, that the report be accepted. Motion passed.

Ginn gave a Foundation Fund Report. Members appointed were Roy Ginn (1 yr), Harold Haskel (2 yr), Earl Wright (3 yr) and Harry Haverland (4 yr). Recommendations using fund include:

- a. Outstanding speaker for keynote address
- b. Developing materials for affiliates
- c. Student projects.

President Brazis called the meeting to order at 8:30 a.m. on Monday, August 6. All members included in the August 5 meeting were present plus newly elected Secretary-Treasurer Robert Gravani.

Paradis gave an updated Local Arrangements Committee Report. Approximately 350 were registered, with breakfast, banquet and all social functions being well supported.

Ruth Fuqua, Chairperson, 1985 Local Arrangements Committee, reported an outstanding selection of social activities were being planned. The meeting is scheduled to begin on Monday, with the National Mastitis Council meeting on Friday. The meetings will be held at the Nashville Hyatt Regency, August 4-8, 1985. A flat room rate of \$54 has been contracted.

Brazis reported that the 1986 meet-



Kathy Hathaway, IAMFES Executive Manager, left; and Earl O. Wright, retired IAMFES Executive Secretary, right; at the 71st Annual Meeting in Edmonton.



Ruth Fuqua, Local Arrangements Chairperson for the IAMFES 72nd Annual Meeting, August 4-8, 1985 at the Hyatt Regency in Nashville, TN. "Y'all come".



1986 IAMFES Annual Meeting at the Radisson South in Minneapolis, MN.

ing is scheduled for Bloomington, Minnesota, August 3-7 at the Radisson South. Room rate is \$63 (flat rate). Bill Coleman, Department of Agriculture, and Mike Pullen, University of Minnesota, will serve as Co-Chairmen.

Clem Honer gave an invitation for Chicago in 1987. No action was taken.

Past presidents Atherton, Arledge, Fry, Wright, Thompson and Whitehead were welcomed to the meeting. Also attending were Robert Sanders and Pinky Holtgrieve.

A lengthy discussion was held with Tommy Thompson, 3-A Symbol Council, Earl Wright, 3-A Standards, and Pinky Holtgrieve, concerning cost to association from printing 3-A Standards and Symbol holders in publications. Uhlman made a motion, seconded by Barnard, that the report be accepted. Motion passed.

Marshall made a motion, seconded by Barnard, that the Executive Board ask the 3-A Symbol Council for payment of one-half of cost of printing list of 3-A Symbol holders twice a year in the DFS. Motion passed.

Past presidents present were given an opportunity to give a short response. In summary, their comments were as follows:

Hutchings:

1. Need for 1-2 page newsletter 2-3 times a year to past presidents to keep them informed of association action.

2. Wyoming will be new affiliate approximately September.

3. Concern DFS drifting toward technical side.

Myhr:

1. Need to promote International at more local affiliate meetings.

2. Need to consider exchange rate between Canada and U.S.

Parkin:

1. President 30 years ago.
2. Request Executive Board members keep living so he will know someone when he attends future meetings.

Thompson:

1. Supports newsletter.
2. Don't forget past presidents as committee members.

Fry:

1. Reminded us to remember, "If it's not broke, don't fix it."

Whitehead:

1. Reminded us that International evolved as a milk sanitarian organization but now must be equally supportive of Milk, Food and Environmental groups.

2. Urged more activity on com-

mittees.

Atherton:

1. Appreciates past presidents dinner.

2. Need clarity on function and goals of JFP and DFS.

3. Concern with proposal for fewer members on Executive Board.

4. Need to keep committees small, active and productive.

Wright:

1. First year he's enjoyed meeting in long time.

2. Board needs to support Executive Secretary with action and not lip service.

3. Be sure all motions and assignments of Executive Board are carried out.

4. Remember we are a Sanitarians' organization for "Service Not Profit."

President Brazis called the meeting to order at 8:00 a.m. on Thursday, August 9. In addition to the Executive Board, Don Paradis, Ruth Fuqua and Elmer Marth were present.

Paradis gave a report of the Local Arrangements which indicated attendance to be over 400, with approximately 66% from the U.S. Although budget figures are incomplete, he assured us we would be in the black.

Fuqua gave a short report regarding the 85 meeting in Tennessee.

Motion by Barnard, seconded by Ginn, to hold the fall Executive Board Meeting at the Hyatt Regency, Nashville, Tennessee, October 19-21, 1984, beginning at 2:00 p.m. Motion passed. Hathaway is to make hotel reservations.

President Brazis discussed the motion passed on Sunday to allow exhibits at the 86 meeting. No formal action was taken on the discussion; however, Holliday will contact Dale Termunde, Chairman, Sustaining Membership Committee, and all sustaining members for their input and report to the fall meeting.

Holliday stated he will contact Warren Clark regarding frequency 3-A Symbol list must be published, inform him of Executive Board action concerning charges, and report to fall meeting.

Townsend made a motion, seconded by Ginn, for Holliday to attend FDA Raw Milk Hearing September 28 and present IAMFES Resolution passed during this meeting. Motion passed.

Ginn will make specific recommendation on the use of Foundation Fund money at the fall Executive Board meeting.

Marth made the following recommendation from the Advisory Committee on Annual Program Scientific Content:

1. Use of Foundation Fund for Overseas Keynote Speaker on Food Protection at annual conference.
2. Open session of annual meeting should be on Monday evening and the mixer after this, and free up Tuesday morning for a scientific session.
3. Symposium for next year, one on Radiation and one on Acid Bacteria.
4. Those receiving Sanitarian and Educator Awards be obligated to give a lecture at annual conference.

The Proposed Constitution changes will be submitted to all members by first class mail with ballot and letter from Holliday that the changes were approved and recommended by the Executive Board, and the member-

ship at the annual meeting accepted the proposals and recommended the changes be submitted to the entire membership. The By-Laws changes which support the Constitution were passed at the annual business meeting.

Holliday appointed a CEU Study Committee of Richard Brazis, Chairman, and Harry Haverland.

Holliday appointed Townsend to be in charge of Committees during 84-85. Townsend will review all committee membership at the fall meeting. Each chairman will be contacted to submit a written report to the Ames office by June 1 for duplication and submission to Executive Board. Only committees making recommendation will be asked to make an oral report at the Executive Board Meeting. All committees should give a summary of their report at the Business Meeting. Gravani made a motion, seconded by Ginn, that this policy be followed. Motion passed.

Barnard made a motion to adjourn, seconded by Ginn. Motion passed.



Archie Holliday, 1984-85 IAMFES President.



Affiliate Council Meeting chaired by Helene Uhlman.



Affiliate Council Meeting.

Journal of Food Protection Management Committee

The Committee met on August 6, 1984 at the Edmonton Inn, with 15 members and guests present. As usual, discussions centered upon ideas for improvement of the Journal. Twelve recommendations were made. Consistent with the expressed wishes of the Executive Board, the recommendations are divided between those that we believe require the attention of the Executive Board and those that can be resolved in discussions between the Technical Editors of the *Journal of Food Protection* and the Managing Editor.

Recommendations for consideration of the Executive Board are as follows:

1. We recommend that 3-A Standards as well as 3-A Symbol Holders no longer be published in the *Journal of Food Protection*.

2. We recommend that the Executive Board respect the wishes of the membership and change the name of the organization to the International Association of Food Protection.

Recommendations for resolutions by the Technical and Managing Editors:

1. We recommend that the *Journal of Food Protection* be listed in the Allen Press series of scientific journals for a period of at least 3 years. This is designed to increase circulation.

2. We recommend that the Technical Editors of JFP review Morbidity and Mortality Reports as well as the Canadian Diseases Weekly, and select appropriate articles on foodborne outbreaks and supply these to the Managing Editor for reprinting in JFP.

3. We recommend that one-half of the Editorial Board of JFP be appointed for a 3 year term and the other half for a 4 year period. This pertains only to those members of the Board to be reappointed or replaced at the end of 1984.

4. We recommend that the affiliate newsletter not appear in JFP.

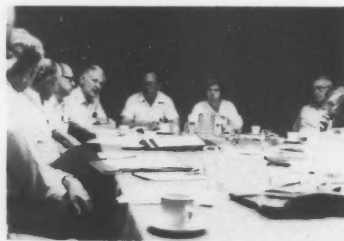
5. We recommend that the listing of new members not appear in JFP.

6. We recommend that the calendar of upcoming meetings not appear in JFP.

7. We recommend that no classified advertisements appear in JFP.

8. We recommend that the annual meeting program be published in JFP.

9. We recommend that the methods section of scientific articles



Journal Management Committee Meeting.

in JFP be published in 9 point type.
10. We recommend that JFP not publish book reviews.

Respectfully submitted:

Dr. R. B. Read, Jr. (Pete),
Chairman

Applied Laboratory Methods Committee

The Applied Laboratory Methods Committee was called to order at 1:00 p.m. August 6, 1984.

The first topic of discussion was the Interrupted Incubation Standard Plate Count Collaborative Study conducted by Ken Smith, University of Florida. Resulting from this discussion, the following action steps were established by an affirmative vote:

1. Ken Smith would be requested to put the study into a publishable format.

2. The original data would be submitted through Clair Gothard to Tim Peeler, FDA, for statistical analysis.

3. The article, based on satisfactory completion of items 1 and 2, would be submitted for publication.

4. Applied Laboratory Methods Committee would present this, when published, to:

- Standard Methods Committee for the Examination of Dairy Products, as a proposed accepted method.

- National Council Interstate Milk Shippers, as a problem for consideration as a method to be used in the IMS program.

The Committee then discussed the need for greater technical interaction between IAMFES and IDF in the area of international methods. This discussion was led by Harold Wainess and Pete Read. The discussion ended with the Committee voting affirmatively to recommend to the Board that IAMFES support the international laboratory methods activities of IDF and, if possible, have representatives attend both the Chemical and Microbiological week meeting.

The next topic discussed was that of the Applied Laboratory Methods

Committee's structure. New subcommittee chairpersons were announced as follows:

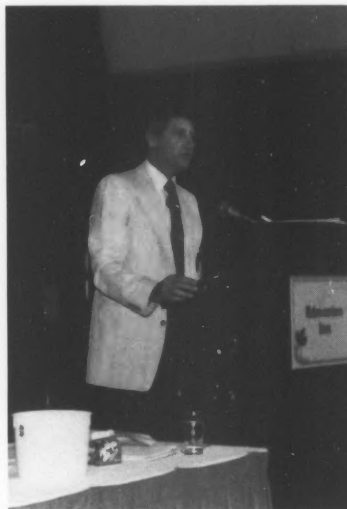
Ruth Fuqua - Milk and Milk Products

Lawrence Roth - Foods

Clair Gothard - Water and Environment.

Respectfully submitted:

Joe Byrnes, Chairman



Frank Bryan, Chairman, Committee on Communicable Diseases Affecting Man.

Sanitarians Joint Council

This Council is composed of two representatives from each of 4 Sanitarian groups: IAMFES, NEHA, NSPS, and a Section on the Environment of APHA. Three members were present at the meeting: Harold Bengsch, NSPS; Frank Bryan, substitute for Dick Clap, APHA; and Bob Sanders, IAMFES.

A discussion was held regarding the recent action by the Council of State Government's refusal to support the Model Sanitarians Registration Act.

Alternate forms of action were discussed to get widespread distribution and adoption of this Model Act. These will include direct distribution of copies of the Act to State Health, Agricultural and other officials who

employ Sanitarians, as well as the Secretaries of IAMFES affiliates.

Respectfully submitted:

Robert L. Sanders,
IAMFES Representative to
Sanitarians Joint Council

3-A Sanitary Standards Symbol Administrative Council

The 3-A Symbol Council office was relocated to Waukesha, WI from Ames, IA a year ago this past Spring, and I am pleased to report that the move went smoothly and all activities continued without interruption.

During the past year there was one replacement on the Council. Dr. A. Richard Brazis replaced Mr. Pat J. Dolan as a representative of the IAMFES.

The 3-A Sanitary Standards Symbol Administrative Council held two meetings since last year -- one on October 24, 1983 in Chicago, and the other on May 17, 1984 in Milwaukee, at which time it concluded the action on a non-compliance complaint regarding valves.

The Council has acted to reiterate its position with regard to advertising which references the 3-A Symbol. A letter has been sent to all holders of the 3-A Symbol advising that no advertising should contain statements that 3-A *approves* equipment.

Thirteen authorizations were discontinued since August, 1983, and 25 new authorizations were granted during the same period. The August, 1984 count is 247 active authorizations.

The next 3-A Symbol Council meeting will be held on October 16, 1984, in San Francisco.

Robert E. Holtgrieve, who currently serves as Asst. Sec'y-Treasurer of the Council, has been appointed liaison representative for IAMFES on the Symbol Council.

Respectfully submitted:

Robert E. Holtgrieve,
Asst. Secretary-Treasurer



*Don Paradis, Local Arrangements Chairman
in Edmonton.*

Committee on Food Equipment Sanitary Standards

The IAMFES Committee on Food Equipment Sanitary Standards, known hereafter as 'the Committee,' is charged with the responsibility of carrying out the following objectives:

1. To cooperate with other interested health and regulatory organizations and food-related industries in the formulation of sanitary standards and educational materials for the fabrication, installation, and operation of food equipment and food vending machines.

2. To provide advice to the food and vending industry in improving the design, construction and installation of food equipment so that the equipment will be easy to clean and will function properly when placed into service.

3. To cooperate with the food industry in the preparation of standards or guidelines which are acceptable to both the food industry and to regulatory/public health agencies, thereby securing uniform quality and nationwide acceptance of such equipment.

4. To present to the IAMFES membership those standards and educational materials which the Commit-

tee recommends be endorsed by the Association.

The Committee reported the action, or proposed action, taken during the past year by two health and industry organizations with which the Committee interacts: the National Sanitation Foundation's Joint Committee on Food Equipment Standards, and the National Automatic Merchandising Association's Automatic Merchandising Health Industry Council (AMHIC).

The following recommendations have been made by the IAMFES Committee on Food Equipment Sanitary Standards:

1. That the International Association of Milk, Food and Environmental Sanitarians reaffirm its support of the National Sanitation Foundation and the National Automatic Merchandising Association and continue to work with these two organizations in developing acceptable standards and educational materials for the food industry and for the public health sector;

2. That the Association urge all sanitarians to obtain a complete set of the National Sanitation Foundation's Food Equipment Standards and Criteria; a copy of the National Automatic Merchandising Association/Automatic Merchandising Health Industry Council's Vending Machine Evaluation Manual; a copy of the Food Service Equipment and Vending Machine listing and related educational materials, so as to evaluate each piece of food equipment and each vending machine in the field to determine compliance with the applicable sanitation guidelines (construction and installation specifications), and to let this Committee and the appropriate evaluation agency know of any listed manufacturer or fabricator failing to comply with any of these guidelines.

3. That the Association urge all sanitarians and regulatory agencies to support the work of the Committee; to submit suggestions for developing new guidelines and for amending same; and to subscribe, by law or administrative policy, to the principles represented by the Standards, Criteria, and Evaluation Manual for

food equipment and vending machines.

Respectfully submitted:

Karl K. Jones, Chairman



Dr. Robert Gravani.

Nominating Committee

The 1984 Nominating Committee consisted of the following members of the International Association of Milk, Food, and Environmental Sanitarians:

George Andrews, Seattle, WA
Kirmon Smith, Austin, TX
Steve James, Lincoln, NE
Charles Price, Lombard, IL
David Bandler, Ithaca, NY
Kenneth Whaley, Hermitage, TN
Don Paradis, Edmonton, Alberta, Canada
Erwin Gadd, Jefferson City, MO (Chairman).

Various members of the IAMFES presented to the committee a total of six individuals representing the academia interests of the IAMFES. Following personal contacts of the six individuals, the committee recommended two candidates. The membership was notified of the candidates in the December 1983 issue of the two Association journals. Ballots were distributed to the membership

and on return mail were counted. A count of the ballots revealed that Mr. Robert Gravani, New York, received the majority.

Through this report, the Chairman expresses appreciation to those members of the Association who contributed to committee efforts.

Respectfully submitted:

Erwin P. Gadd, Chairman

Dairy and Food Sanitation Management Committee

1. Due to the recommendations of the Journal Management Committee of JFP that publication of 3-A Symbol Holders not be published in the JFP, the Journal Management Committee of DFS recommends the following:

a. 3-A Symbol Holders be published in DFS at no charge.
b. That said listing be published only once every twelve (12) months and that an appropriate reference to that publication be printed in each monthly DFS journal.

2. A new section be added to the Journal consisting of reprints from MMWR and the Canadian Diseases Weekly Report pertaining to food and other environmentally induced morbidity and mortality.

3. The committee recommends that a technical editor be added to the Editorial Review Committee. Henry Atherton will accept.

Respectfully submitted:

Harold Bengsch, Chairman



Dairy and Food Sanitation Management Committee Meeting.

International Dairy Federation Committee

The report this year will be divided into two sections. The first will deal with the IDF Annual Sessions held in Oslo in 1983 and the second with the activities of the United States National Committee (USNAC) in the past year.

The IDF Annual Sessions met on July 3-8, 1983, in Oslo, Norway. The work of the IDF is divided into six Commissions, each dealing with a different technical aspect of the dairy industry. The Commissions are:

- A - Production, Hygiene and Quality of Milk
- B - Technology and Engineering
- C - Economics, Marketing and Management
- D - Legislation, Compositional Standards, Classification, Terminology
- E - Analytical Standards, Laboratory Techniques
- F - Science and Education

Many subjects of interest to IAMFES were covered by the Commissions. The 1984 Sessions will be held September 17-21 in Prague, Czechoslovakia.

USNAC's growth has been slower than anticipated, although they now have 40 members. In the last year they gained five and lost two, and will be embarking on a publicity campaign to attempt to obtain additional members from industry, academia, and government, and the article published by your representative in *Dairy and Food Sanitation* will be used for this purpose. The *Cheese Reporter* has also written an excellent editorial on the importance of USNAC/IDF to the U.S. dairy industry.

There will be at least fourteen delegates to the Annual Sessions in Prague so that we will have complete coverage of the activities of each Commission.

For 1985, in conjunction with DFISA, USNAC in cooperation with IDF is planning a full scale symposium entitled "New Dairy Products via New Technology." This will be a comprehensive program with invited

speakers from all over the world. The sessions will be held in conjunction with the Dairy and Food Expo in Atlanta, Georgia, October 5-9, 1985. A final program should be ready for distribution by the end of this year. These dates were established to coordinate with the 1985 Annual Sessions of IDF in New Zealand, thus enabling participants from other countries, mainly in Europe, to attend the symposium, visit the DFISA Expo and then go on to the Annual Sessions.

John Sliter, who has been Chairman of USNAC from its inauguration, could not stand for re-election due to the press of other activities, and Robert Sellars was elected Chairman, with Fred Greiner as Assistant Chairman.

In the past year USNAC has distributed 25 Questionnaires and 19 Circulars from IDF. These include such subjects as Mastitis Control, Fresh and Soft Cheese Packaging, and Automated Processes in Dairy Control Systems.

Respectfully submitted:

Harold Wainess,

IAMFES Representative to the IDF

Farm Methods Committee

A major focus of the Farm Methods Committee throughout the past year has been on reorganization. Ken Kirby and Steve Sims were appointed Assistant Chairmen. To improve the flow of communications and oversee the development of new charges, six subcommittees were assigned to Ken and six to Steve. Several new subcommittee chairmen were appointed to replace those who had resigned or become inactive, and several new members were appointed to serve on various committees to fill vacancies.

A plan of action has been implemented with the purpose of redirecting and revitalizing individual subcommittees which had fallen into relative inactivity. Thirty-two mem-

bers attended the IAMFES Farm Methods Committee meeting held in conjunction with the N.M.C. meeting on February 13, 1984, and the major topic of discussion was the review of old and new charges. All subcommittee chairmen were requested to submit new charges for review and acceptance at the IAMFES meeting in Edmonton, Alberta, Canada, on August 6, 1984. Subcommittee chairmen were contacted in May and urged to solicit the cooperation of their subcommittee members in fulfilling charges that have not been completed and developing new charges.

Other discussion focused on the outward distribution of informative material which has been developed by various subcommittees, and how this system of information development and distribution might be changed. It was suggested that technical material prepared and approved by various subcommittees be submitted for publication in national and regional publications, i.e. *Dairy and Food Sanitation*. It was also decided that material be made available for distribution at various trade meetings. Jeffrey Ryan was appointed Chairman of the Editorial Review Subcommittee. This subcommittee will be able to aid in fulfilling our outward goals.

There have been several new charges during the past year. The Water Treatment and Protection Subcommittee, chaired by Dr. Henry Atherton, is to have ready by February an article on ultraviolet water treatment - pros and cons. This subcommittee also has plans for several projects in the future, including a bibliography on farm water supply and an article on recirculated cooling water. The Sampling Raw Milk Subcommittee, with Chairman Virgil Grace, has accepted a charge to do a pictorial article on sampling, if Virgil can write it in December and review it with the subcommittee members for final draft at the National Mastitis Council. Editorial Subcommittee Chairman Jeff Ryan has been calling other subcommittee chairmen, trying to encourage them, and has accepted and is fulfilling his charges as stated previously.

On behalf of the assistant chairmen, Ken Kirby and Steve Sims, the subcommittee chairmen, and all the members of the Farm Methods Committee, I want to take this opportunity to thank the executive board for their support this past year. We look forward to a productive year in 1985.

Respectfully submitted:

Maynard E. David, Chairman



Dr. Allen Kraft, ISU, Ames, IA.

3-A Sanitary Standards Committee on Sanitary Procedures

The Ad Hoc Meeting, held in December, 1983, was for the purpose of a review of items for future 3-A Meetings. Items covered at the Ad Hoc Meeting were as follows: (1) Tentative revision of 3-A Sanitary Standards for Milk and Milk Products Evaporators and Vacuum Pans, Number 1604; (2) Tentative 3-A Sanitary Standards for Wet Collectors for Dry Milk and Dry Milk Products; (3) Tentative amendment to 3-A Sanitary Standards for Bag Collectors for Dry Milk and Dry Milk Products; (4) Tentative amendment to 3-A Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products, Number 08-17 Rev.

The regular 3-A Meeting on May 15-17, 1984, covered and took action on a full agenda.

We regret the loss of Peter J. Benedetti and F. Tracy Schonrock, but welcome Bruce A. Marzolf and Duane R. Spomer as active members of CSP.

The committee could use an additional six or eight members to provide a broader input. Please contact me.

Respectfully submitted:

Dick B. Whitehead, Chairman

*IAMFES Secretary-Treasurer
Report*

The 1983 Annual Business Meeting of the International Association of Milk, Food, and Environmental Sanitarians was held Tuesday, August 8, at the Marriott Pavillion Hotel, St. Louis, Missouri.

President Robert Marshall called the meeting to order at approximately 10:20 a.m.

Minutes of the 1982 Annual Business Meeting were approved as published in the Journal.

Retiring Executive Secretary Earl Wright gave a review of association activities during his ten-year term. Accomplishments included:

1. *Journal of Food Protection* has grown from a 50-page to a 90-page journal which is received on a regular basis in 90 different countries.
2. Publication of *Dairy and Food Sanitation* is now in its third volume.
3. Purchase of our own computer.
4. Increase of advertising dollars.
5. Development of sustaining membership.
6. Establishment of Foundation Fund.

Treasurer's Report given by Earl Wright indicated 82 income to be \$309,993.80, with expenses of \$264,795.55 for a net profit of \$45,198.15.

Committee reports given included:

- Foundation Fund
- Local Arrangements
- Finance and Budget
- Awards
- International Dairy Federation
- Journal of Food Protection Management*
- Dairy and Food Sanitation Management*

Food Equipment Sanitary Standards

- 3-A Sanitary Standards Applied Laboratory Methods
- 3-A Symbol Council
- Nominating
- Shellfish Sanitation Conference
- Baking Industry Sanitation Standards
- Resolutions.

A summary of each of these committee reports and the Report of Affiliate Council were published in the November issue of the *Dairy and Food Sanitation Journal*.

Archie Holliday was appointed IAMFES representative to the 1984 National Conference on Food Protection.

The 3-A Symbol Office will be moved to Waukesha, Wisconsin.

Harry Haverland announced that Harold Bengsch will be Chairman of the Sanitary Joint Council and Robert Sanders will be Secretary-Treasurer.

Erwin Gadd was appointed Chairman of the Nominating Committee.

The meeting adjourned at approximately 11:55 p.m.

Respectfully submitted:

Leon Townsend,
Secretary-Treasurer



Canadian Royal Mounties and a piper lead the head table at the banquet.



Past-Presidents table at the banquet.



Entertainment at the Annual Awards Banquet.



Trying the "Limbo" at the banquet entertainment.

RESOLUTION I.

WHEREAS:

The Alberta Association of Milk, Food and Environmental Sanitarians has planned, organized and executed the hosting of the 71st Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, and

WHEREAS:

Members and Guests who attended the meeting were educated and entertained in an exceptional way, and

WHEREAS:

Large numbers of persons associated with the Alberta Affiliate helped to host the meeting,

NOW BE IT RESOLVED:

That the IAMFES President express to the Alberta Affiliate our sincere thanks for a job well done.

RESOLUTION II.

WHEREAS:

The numerous firms associated with milk, food and the environment contributed to the educational and social

aspects of the 71st Annual Meeting of IAMFES, and

WHEREAS:

These contributions made the meetings meaningful and enjoyable,

NOW BE IT RESOLVED:

That the President of IAMFES express the thanks of the Association to the President of the Alberta Affiliate and the Chair of the Local Arrangements Committee, asking them to express our thanks through available instruments of communication.

RESOLUTION III.

WHEREAS:

The management and staff of the Edmonton Inn provided excellent accommodations and courteous service to members and guests of IAMFES attending the 71st Annual Meeting, and

WHEREAS:

There was good cooperation on the part of personnel of the Edmonton Inn,

NOW BE IT RESOLVED:

That the President of IAMFES express appreciation to the Manager of the Edmonton Inn.

RESOLUTION IV.

WHEREAS:

Outbreaks of illness due to the consumption of raw milk have been reported recently, and

WHEREAS:

This International organization is dedicated to promotion of the safety of the food supply, including milk,

NOW BE IT RESOLVED:

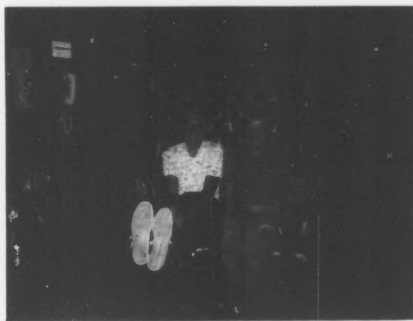
That the International Association of Milk, Food and Environmental Sanitarians, through its President, inform the Commissioner of the U.S. Food and Drug Administration and the hearing officer for the upcoming public hearing on raw milk that IAMFES supports a ban on sale of raw milk in beverage form in interstate commerce.

Respectfully submitted:

R. T. Marshall, Chairman
Resolutions Committee



Earl Wright, retired Executive Secretary of IAMFES, relaxes for lunch with Marilyn Saltzberg, Angenics (left) and Amber Nordine (middle), Advertising Representative for the IAMFES Journals.



"Uncaptioned."

There were just too many good captions for this picture of Past President A. Richard Brazis and President Archie Holliday, so we'll let you create your own.



Join Chairperson Ruth Fuqua for the 1985 IAMFES Annual Meeting, August 4-8, 1985 in Nashville, TN at the Hyatt Regency. Registration forms will be in Dairy and Food Sanitation beginning with the January 1985 issue.

Awards . . .

IAMFES EDUCATOR AWARD TO R. BURT MAXCY

Dr. R. Burt Maxcy has been awarded the IAMFES Educator Award, receiving \$1000 and a plaque for recognition of his leadership, scholarship and outstanding academic contributions to food safety and sanitation.

Dr. Maxcy is a Professor at the University of Nebraska and has also worked for the Diversey Corporation, the University of Wisconsin, Kansas State University and the U.S. Navy.

His research has dealt with the microenvironment of food and food handling systems, as well as irradiation of foods.

As a teacher, Dr. Maxcy presents outstanding courses in Quality Assurance of Foods and in Advanced Food Microbiology. He also supervises 3 to 5 graduate students regularly.

The expertise of the recipient has been widely recognized by those who invited him to present special lectures and to consult. In fact, he presented major papers to IAMFES on food irradiation in 1981 and on the microenvironment of food processing equipment in 1983.

He has served his present university since 1958. As a result of Dr. Maxcy's work there, his former students wrote many compliments regarding him. One wrote how he is a developer, a catalyst and a diversifier.

(no picture available)

OMER MAJERUS RECIPIENT OF HAROLD BARNUM AWARD

This year's recipient of the \$500 Harold Barnum Award is Omer Majerus, for his outstanding contributions to the International, his state's Sanitarians organization, and to the numerous groups associated with milking dairy cows.

Mr. Majerus has served as President of the Minnesota Sanitarians Association and was a charter member of the National Mastitis Council. He is a three-time past president of the Milking Machine Manufacturer's Council.

A significant contribution of the recipient is his highly professional presentation of educational programs on milking machines and milking practices. A more recent accomplishment has been his promotion of research on stray voltage in dairy barns and of a large grant to a team to do research on Dairy Chore Reduction.

Mr. Majerus has retired as marketing manager of the Universal Milking Machine Division, Universal Cooperatives, Inc. He has been a long time member and participant in the IAMFES Farm Methods Committee.

(no picture available)

1984 SHERMAN AWARD PRESENTED FOR FOOD TEMPERATURE ARTICLE

The 1984 Norbert F. Sherman Award was presented to Dr. M. Eileen Matthews, Department of Food Science, University of Wisconsin-Madison, and Susan J. Ridley, Diagnostics Department, St. Mary's Hospital, Madison, Wisconsin. C. Dee Clingman, Director of Quality Control, Red Lobster Inns of America, and Paul F. Martin, Director of Instructional Planning, National Institute for the Foodservice Industry (NIFI), presented the award for NIFI.

The Sherman Award is offered annually by NIFI, the foodservice industry's not-for-profit educational foundation, to provide recognition to articles that best reflect the principles of Norbert F. Sherman, late chief executive of North American Foodservice Companies, Inc., and former NIFI Treasurer.

The 1984 winners published an article in the February 1983 issue of the *Journal of Food Protection* entitled "Temperature Histories of Menu Items During Meal Assembly, Distribution and Service in a Hospital Foodservice."



Dr. Elmer H. Marth accepting the 1984 Sherman Award, from Paul Martin, for Dr. M. Eileen Matthews and Susan J. Ridley.

CITATION AWARD PRESENTED TO ELMER MARTH

The Citation Award this year was presented to Dr. Elmer Marth, Editor, *Journal of Food Protection*.

Dr. Marth is an educator, researcher, an expert in Sanitary Science and a long standing active contributor to IAMFES. He has served continuously since 1967 as a member of the Journal Management Committee and of the Program Committee. During the period 1968-1970, he also served as a member of the Applied Laboratory Methods Committee.

Dr. Marth has provided the necessary leadership and stimulus for the evolution of the *Journal of Food Protection* from the position of a good Journal to one that is recognized world wide as an excellent scientific journal in food protection. Today, the Journal can be found in libraries in nearly seventy countries.



Dr. Elmer H. Marth receives The Citation Award from Dr. A. Richard Brazis.

SANITARIAN OF THE YEAR HAROLD WAINESS

For his untiring efforts in dairy sanitation and his important contributions to IAMFES, Harold Wainess has been named Sanitarian of the Year for 1984 and has been awarded \$1000.

After receiving his Master's degree at Purdue University, Mr. Wainess opened a consulting service and continues that business today. However, he devotes much time to health-related organizations, especially IAMFES, and to dairy-related organizations, particularly the U.S. National Committee of the International Dairy Federation (IDF). This year he will become a member of the Permanent Commission on Technology and Engineering of IDF.

Previously he was awarded honorary degrees from Washington State and Utah State Universities.



Sanitarian of the Year Award presented to Harold Wainess by Maynard David of Diversey-Wyandotte. Looking on is (l) Charles McDuff of Economics Laboratory and (r) Al Lahr of H. B. Fuller Co.



Floyd Bodyfelt accepting Honorary Life Membership for Paul R. Elliker.

HONORARY LIFE MEMBERSHIP TO PAUL ELLIKER

Dr. Paul R. Elliker, Professor Emeritus, Department of Microbiology, Oregon State University, has been named as an Honorary Life Member of the IAMFES.

Dr. Elliker served as President of IAMFES from 1966-67 and taught courses in dairy microbiology and contamination control to hundreds of students during his 25 years as Professor and Chairman of the Department of Microbiology at Oregon State University. He was particularly concerned about contamination of dairy and food products and worked closely with quality control people who were responsible for sanitation in dairies, cheese plants, and canneries. He was undoubtedly responsible for the dairy industry being many years ahead of other food processors in quality and contamination control. He has definitely promoted the ideals and goals of IAMFES through his research, his teaching and his contacts with industry.

CERTIFICATE OF MERIT TO KENNETH SMITH

The Certificate of Merit was presented to Dr. Kenneth L. Smith, Department of Food Science, University of Florida, Gainesville, Florida. This award is presented to those members who are active within their affiliate and international group.

Dr. Smith has been a member of IAMFES since 1960. He has served on the Board of Directors in various capacities for a total of sixteen years. He was Secretary in 1961-64, and President in 1961 and 1983-84.



David Fry accepting Certificate of Merit for Dr. Kenneth L. Smith.

READER SERVICE INFORMATION



International Association
of Milk, Food and
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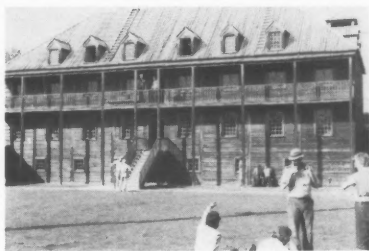
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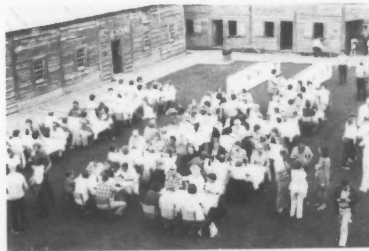
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All find a dry spot as the rain and wind begins.



Waiting for the rain to stop, but keeping the refreshments handy.



Brave souls weather the elements.



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Abstracts of papers in the November Journal of Food Protection

To receive the Journal of Food Protection in its entirety each month call 515-232-6699, ext. A.

Bacteriological Quality of "Soul Foods" from Processing Plants, Adelle W. Stewart and Lucy Ann Martin, Department of Natural Sciences, South Carolina State College, Orangeburg, South Carolina 29117

J. Food Prot. 47:836-837

Bacterial content of "soul foods" from four processing plants was determined. Samples were analyzed for *Staphylococcus aureus*, *Clostridium perfringens*, salmonellae, total coliform, *Escherichia coli* and total aerobic plate count. Chitterlings (washed intestines) from one plant and maws (stomachs of swines) from a different plant contained all of the bacteria for which tests were made. The other food samples contained one or two of the indicator organisms.

Inhibition of Pathogenic Bacteria by Camel's Milk: Relation to Whey Lysozyme and Stage of Lactation, Elie K. Barbour, Nassim H. Nabbut, Wayne M. Frerichs and Habeeb M. Al-Nakhli, Ministry of Agriculture and Water, Regional Agricultural and Water Research Center, Animal Production and Health Section, P.O. Box 17285, Riyadh, Saudi Arabia 11484

J. Food Prot. 47:838-840

Twenty (10%) of 200 milk samples collected from different individual camels inhibited growth of one or more of six pathogenic test organisms in a filter-paper disk assay. The milk samples with inhibitory properties scored zero in the California Mastitis Test. The percentages of milk samples which inhibited *Clostridium perfringens*, *Staphylococcus aureus*, *Shigella dysenteriae* and *Salmonella typhimurium* were 7.5, 4.0, 2.0 and 1%, respectively. None of the 200 samples inhibited *Bacillus cereus* or *Escherichia coli*. Five milk samples inhibited growth of two test organisms and two samples inhibited growth of three organisms. Inhibition zone diameters ranged from 13.5 mm to 22.0 mm (average of 15 mm) using a disk of 12.5 mm in diameter. The average amount of lysozyme in the whey of 58 samples of camel's milk was 288 $\mu\text{g}/100\text{ ml}$. The average lysozyme content of the 20 samples showing growth inhibition of one or more test organisms was 648 $\mu\text{g}/100\text{ ml}$, significantly higher ($P < 0.01$) than the average in the 38 samples (62.6 $\mu\text{g}/100\text{ ml}$) that had no inhibitory effect. There was a negative correlation ($r = -0.669$) between lysozyme content in the whey of milk samples (y) and the stage of lactation of the camels (x) with the following regression equation: $y = -2.86x + 665.8$.

Effect of Temperature and Contact Time on the Activity of Eight Disinfectants - A Classification, P. Gélinas, J. Goulet, G. M. Tastayre and G. A. Picard, Département de sciences et technologie des aliments and Centre de recherche en nutrition, Université Laval, Québec City, Québec, Canada G1K 7P4 and Ecochimie Ltée, Québec, Canada J4G 1S5

J. Food Prot. 47:841-847

The combined influence of temperature (4, 20, 37 and 50°C) and contact time (10, 20 and 30 min) on the efficacy of eight commercial disinfectants was evaluated by the Association of Official Analytical Chemists use-dilution method. An increase of temperature greatly enhanced the activity of all tested solutions, particularly glutaraldehyde, chlorhexidine acetate and the amphoteric surfactant, whereas contact time mainly enhanced the efficacy of sodium hypochlorite, the quaternary ammonium compound and the amphoteric surfactant. Temperature and contact time influenced the activity profile of the disinfectants tested, with a maximum efficacy near the optimum growth temperature (37°C) of the test organism (*Pseudomonas aeruginosa* ATCC 15442). This organism was highly resistant to the amphoteric surfactant as well as to the two quaternary ammonium compounds. Classification of disinfectants is proposed on the basis of their mode of action, temperature dependence and activation energies, heat and light stability, and tolerance to organic matter.

Adhesion and Growth of Thermoresistant Streptococci on Stainless Steel during Heat Treatment of Milk, Frans M. Driessen, Jógé De Vries and Fedde Kingma, Netherlands Institute for Dairy Research, P.O. Box 20, 6710 BA Ede GLD, The Netherlands

J. Food Prot. 47:848-852

Streptococcus thermophilus adheres to plates of cheese-milk pasteurizers during the operating time. The adherence of these bacteria in the regenerator section of the heat exchanger is much larger than in the heating section. Calcium phosphate deposits are higher in the heating section than in the regenerator section. In a series of laboratory experiments with batch cultures of *S. thermophilus* B, adherence of this organism on stainless steel was determined after growth in the milk was nearly completed. It was found that *S. thermophilus* B adhered equally well to stainless steel in raw as in pasteurized milk cultures. Pre-coating of stainless steel with calcium phosphate reduced bacterial adhesion maximally by only 50%. It was shown that initiation of growth of *S. thermophilus* B was delayed in raw milk and not in pasteurized milk. The experimental set-up was thereafter changed in such a way that either raw or pasteurized milk containing high numbers of viable *S. thermophilus* B streamed in a continuous flow along stainless steel. In this way a better simulation of the practical situation could be achieved. Now the initial adhesion of bacteria to stainless steel along

which raw or pasteurized milk passed was approximately the same. During longer operating times, however, the population of bacteria on the steel in pasteurized milk increased much faster than on steel in raw milk. After 4 h of operating time stainless steel test plates contained 1.0×10^7 and 7.0×10^5 cfu/cm², respectively. It is suggested that raw milk contains growth-inhibiting compound(s), and by continuous feed of raw milk the effect of the inhibiting compound(s) is substantially increased. This results in a slow increase of the bacterial number on the surface. When pasteurized milk streams along the plates, bacterial growth is not inhibited, resulting in a fast increase.

Acid-Coagulation of Evaporated Milk by a Coculture of *Enterococcus faecium* and *Bacillus subtilis*, Robin C. McKellar and Diana Nichols-Nelson, Food Research Institute, Research Branch, and Dairy, Fruit and Vegetable Division, Food Production and Inspection Branch, Agriculture Canada, Ottawa Canada, K1A 0C6

J. Food Prot. 47:853-855

Two gram-positive microorganisms, a spore-forming rod and a coccus, were isolated from a can of evaporated milk which had coagulated after storage at 37°C for 3 months. The two strains were identified as *Bacillus subtilis* and *Enterococcus faecium*, respectively. Individually, neither strain produced acid in sterile skim milk; however, when cultured together, the pH dropped rapidly and the milk coagulated. Similar results were obtained with *E. faecium* and a proteolytic *Pseudomonas* sp. Acid production by *E. faecium* in sterile skim milk was closely related to proteolysis produced by addition of partially purified *B. subtilis* proteinase. Acid production was also stimulated by addition of enzymatic digests of casein. It was concluded that spoilage in canned evaporated milk had resulted from production of acid by *E. faecium* when supplied with small molecular weight nitrogenous compounds derived from milk proteins by the action of *B. subtilis* proteinase.

Twenty-Four Hour Isolation and Confirmation of *Bacillus cereus* in Foods, Richard A. Szabo, Ewen C. D. Todd and M. Khalil Rayman, Bureau of Microbial Hazards, Health Protection Branch, Health and Welfare Canada, Tunney's Pasture, Ottawa, Ontario, Canada K1A 0L2

J. Food Prot. 47:856-860

An existing *Bacillus cereus* isolation medium (PEMBA composed of polymyxin, pyruvate, egg yolk, mannitol, bromthymol blue and agar) has been modified and its comparative performance evaluated. Bromthymol blue was replaced with brom-

resol purple, hence the new medium was designated PEMPA. The advantage of this modification was decreased incubation time (from 48 h to 22 h) and an increased ability to recognize presumptive isolates. Recoveries of 20 reference strains of *B. cereus* inoculated into rice and tested on three selective media (PEMPA, PEMBA and MYP composed of mannitol, egg yolk and polymyxin) compared favorably. Additionally, quantitation of *B. cereus* from 23 naturally contaminated foods on MYP, PEMBA and PEMPA, and from 39 naturally contaminated foods on PEMBA and PEMPA gave comparable results.

Bacteriology of Indole Production in Shrimp Homogenates Held at Different Temperatures, Rodney Smith, Ranzell Nickelson, Roy Martin and Gunnar Finne, Department of Animal Science, Texas A&M University, College Station, Texas 77843 and National Fisheries Institute, 1101 Connecticut Ave., N.W. Washington, D.C. 20036

J. Food Prot. 47:861-864

Homogenized, head-on, white shrimp (*Penaeus setiferus*) were held at 4, 12 and 22°C until putrefactive spoilage occurred. Repetitive bacterial sampling was performed and 1647 bacterial isolations were made from the shrimp homogenates. Of these, 42 isolates (2.6%) produced indole. Isolates that produced indole belonged to the genera *Flavobacterium* (52.4%), *Aeromonas* (23.8%), *Proteus* (21.4%) and *Yersinia* (2.5%). No *Escherichia coli* were isolated. *Aeromonas* and *Proteus* exhibited proteolysis and were able to produce indole in shrimp extracts without added L-tryptophan. These organisms favored higher growth temperatures. The majority of the *Flavobacterium* isolates were psychrotrophic, non-proteolytic and could not produce indole in shrimp extracts without added L-tryptophan. Suppression of bacterial reproduction with antibacterial compounds inhibited indole production. Two paths of indole production are suggested based on temperature of decomposition.

Antibiograms of *Staphylococcus aureus* Isolates from Some Ready-To-Eat Products, J. K. P. Kwaga and A. A. Adesiyun, Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria

J. Food Prot. 47:865-867

A total of 229 isolates of *Staphylococcus aureus* from five ready-to-eat products in Nigeria were tested for their sensitivity to ten commonly used antibiotics. One hundred thirty-eight (60.3%) isolates were resistant to one or more of the antimicrobials but none to all. The resistance of isolates varied from 46.0% in dried fish to 78.1% in roasted beef. The incidence of resistance was 55.3, 58.8 and 69.4% in isolates from fried chicken, dried beef and fried fish, respectively. There was no significant difference in resistance of isolates from various food products ($P > 0.05$, X^2). Overall, resistance to penicillin (41.0%), ampicillin (28.4%) and trimethoprim (27.9%) were most frequent, whereas isolates were least resistant to erythromycin (1.3%), neomycin (0.4%) and gentamycin (0.4%). The predominant antimicrobial resistance patterns, irrespective of food source, were penicillin and ampicillin (11.4%), trimethoprim (11.4%) and penicillin (7.9%). Since these staphylococcal isolates were from ready-to-eat products of animal origin exposed to human handling during preparation and sale, their antimicrobial resistance patterns are suggestive of the extent of misuse in medical and veterinary practices in Nigeria.

Immunodiffusion Detection of *Clostridium botulinum* Colonies, Timothy Lilly, Jr., Donald A. Kautter, Richard K. Lynt and Haim M. Solomon, Division of Microbiology, Food and Drug Administration, Washington, D.C. 20204

J. Food Prot. 47:868-870

Toxic colonies of *Clostridium botulinum* types A, B, E and F were detected by precipitating toxin around the colonies on agar containing antitoxin. Incorporating antitoxin in a gel diffusion agar overlay after colonies had developed was unsatisfactory for detection of type E, but worked well for all types when added directly to the plating medium. Addition of 0.6 IU of antitoxin per ml of agar gave satisfactory results with all types except type E. Zones of precipitation were produced by proteolytic strains of types A, B and F incubated at 35°C for 3 d and by nonproteolytic strains of types B and F incubated at 28°C for 4 d; type E required 1.2 IU of antitoxin per ml of agar and 5 d of incubation at 35°C. Nontoxicogenic putrefactive anaerobes produced no zones of precipitation with any of the antitoxins, and toxic colonies of *C. botulinum* mixed among them were easily distinguished. This method was used successfully for selecting type B colonies from plates containing toxic enrichment cultures of tomato juice.

A Liquid Chill System for Rapid Cooling of Meats, Raymond A. Stermer, Thomas H. Camp and Clayton F. Brasington, U.S. Department of Agriculture, Agricultural Research Service, Meat Processing & Marketing Research, P.O. Box ED, College Station, Texas 77841

J. Food Prot. 47:871-875

An experimental hydrochiller system (HCS) using a recirculated propylene glycol solution was designed and constructed. This system provided more rapid chilling of meats than conventional air chilling (CAC). The unit was tested using beef variety meats (VM; $n=28$ for each VM) obtained immediately after evisceration (30 to 40°C). Temperatures were monitored during chilling by thermocouples placed in the center of the thickest portion of each organ. A least squares regression analysis of the heat transfer equation, $\log_{10} (T - T_1) = (-t)/f + \log_{10} j (T_0 - T_1)$, was performed to provide cooling models for various VM organs chilled by HCS or CAC. The heating or cooling rate modulus, f , provided an indicator of rate of cooling. For the HCS, using a propylene glycol solution temperature, T_1 , of -9°C, f ranged from -59 for hearts to -168 for livers. For CAC ($T_1 = -1^\circ\text{C}$), f ranged from -102 for kidneys to -340 for livers. These f -values indicate that CAC requires up to three times as long to reduce the product temperature by 90%. A valuable side effect was a reduced shrink (weight loss) for all three VM chilled with the HCS. The percentage shrinks for HCS vs. CAC were 2.28 vs. 3.67 for livers, 2.19 vs. 4.94 for hearts, and 3.50 vs. 4.69 for kidneys. The HCS could provide: (a) more energy and a space efficient refrigeration system, (b) same-day packaging and shipment of certain types of meat such as VM or boneless boxed meat, and (c) a reduction in labor required for multiple handling of meat products by conventional methods.

Microbiological Quality of Foodservice Menu Items Produced and Stored by Cook/Chill, Cook/Freeze, Cook/Hot-Hold and Heat/Serve Methods, P. O. Snyder and M. E. Matthews, Department of Food Science, University of Wisconsin-Madison, Madison, Wisconsin 53706

J. Food Prot. 47:876-885

Microbiological quality of menu items prepared by cook/chill, cook/freeze, cook/hot-hold and heat/serve methods for producing and storing menu items in foodservice systems is reviewed. Of the 40 studies, 21 focused on the cook/chill method and two on the heat/serve. Nine studies on the microbiological quality of delicatessen and fast food were also reviewed. Microbiological evaluation included total plate count, mesophilic aerobic plate count, psychrotrophic aerobic plate count, streptococcal count, staphylococcal count, clostridial count, coliforms, fecal coliforms, yeast and mold, *Clostridium perfringens*, *Staphylococcus aureus*, *Escherichia coli*, *Clostridium sporogenes*, *Streptococcus faecium*, *Staphylococcus epidermidis*, *Bacillus cereus*, *Bacillus* spp., coagulase-positive staphylococci, fecal streptococci and *Salmonella*. In 29 of the studies, heat was applied to menu items at one or more process steps - initial heating, hot-holding and/or final heating. Initial heating temperatures for entrées ranged from 45 to 90°C, while final heating temperatures ranged from 23 to 98°C. Times ranged from 15 to 90 min for initial heating and 0.33 to 35 min for final heating. Continued research is needed to provide data on effects of time and temperature on the microbiological quality of menu items. Such data will provide foodservice practitioners with adequate assurance that chosen thermal processing methods destroy microorganisms of public health significance.

Alternaria Toxins and Their Importance in Food, A. Douglas King, Jr. and John E. Schade, Western Regional Research Center, Agricultural Research Service, U.S. Department of Agriculture, Berkeley, California 94710

J. Food Prot. 47:886-901

Members of the genus *Alternaria* are known to produce compounds that are pathogenic to plants and other test organisms, including animals. Of the more than 30 compounds produced, tenuazonic acid, alternariol, alternariol methyl ether and altertoxin I are the most toxic to animals. These toxic compounds have been isolated from diseased plant tissue and could be a problem with foods, although only tenuazonic acid has been isolated in small amounts from wholesome foods. A number of *Alternaria* spp. can produce these compounds and some species produce many of the compounds. Growth conditions under which the compounds are produced are not well-defined; generally the optimum temperature for their production is near 20°C.

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

November 26-29, UCD/FDA BETTER PROCESS CONTROL SCHOOL, to be held at the University of California. For more information contact: Robert C. Pearl, Dept. of Food Science & Technology, University of California, Davis, CA 95616. 916-752-0980.

1985

January 3-5, MILLING FOR CEREAL CHEMISTS SHORT COURSE, to be held at Kansas State University, Manhattan, KS. For more information and registration form contact: Dotty Ginsburg, AACCC Short Course Coordinator, 3340 Pilot Knob Road, St. Paul, MN 55121. 612-454-7250. Deadline for registration is Dec. 12, 1984.

January 7-11, TECHNOLOGY OF BAKERY PRODUCTION SEMINAR, to be held at the American Institute of Baking, Manhattan, KS. For more information contact: Mrs. Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

January 14-25, BAKING FOR ALLIED AND NON-PRODUCTION PERSONNEL, to be held at the American Institute of Baking, Manhattan, KS. For more information contact: Mrs. Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

February 4-8, MILK MANUFACTURING SHORT COURSE, North Carolina State University. For more information contact: John Rushing, 919-737-2956, or Bruce Winston, 919-737-2261.

February 13-14, DAIRY AND FOOD INDUSTRY CONFERENCE, The Ohio State University. For more information contact: John Lindamood, Department of Food Science and Nutrition, 2121 Fyffe Road, The Ohio State University, Columbus, OH 43210-1009.

February 15-17, NATIONAL MASTITIS COUNCIL ANNUAL MEETING, to be held at the Frontier Hotel, Las Vegas, NV. For more information and registration materials contact: John Adams, National Mastitis Council, 1840 Wilson Blvd., Arlington, VA 22201. 703-243-8268.

February 25-27, THE LAW AND THE FOOD INDUSTRY, a course to be held at UC Davis, CA. For more information call: 916-752-6021.

February 26-27, 11TH ANNUAL ABC RESEARCH CORPORATION TECHNICAL SEMINAR. For more information contact:

Sara Jo Atwell, Administrative Assistant, ABC Research Corporation, P.O. Box 1557, Gainesville, FL 32607. 904-372-0436.

March 6-7, SECOND ANNUAL CHEESE RESEARCH AND TECHNOLOGY CONFERENCE, to be held at the Sheraton Inn and Conference Center, Madison, WI. For more information contact: Norman F. Olson, Walter V. Price Cheese Research Institute, Department of Food Science, University of Wisconsin-Madison, Madison, WI 53706. 608-263-2001.

March 25-29, MID-WEST WORKSHOP IN MILK AND FOOD SANITATION, The Ohio State University. For more information contact: John Lindamood, Department of Food Science and Nutrition, 2121 Fyffe Road, The Ohio State University, Columbus, OH 43210-1009.

April 14-18, INTERNATIONAL FOOD FAIR OF SCANDINAVIA - TEMA 85, the 8th international fair for food and beverages, held together with the 5th international hotel, restaurant and catering fair. For more information contact: Leslie Christensen, General Manager, Bella Center A/S, Center Boulevard, DK-2300 Kobenhavn, Denmark.

April 15-19, STATISTICAL QUALITY CONTROL SHORT COURSES - STATISTICAL METHODS APPLIED TO PRODUCTIVITY IMPROVEMENT AND QUALITY CONTROL - FOR THE FOOD PROCESSING INDUSTRY, to be held at the University of California, Davis. For more information contact: Robert C. Pearl, Food Science & Technology Dept., University of California, Davis, CA 95616. 916-752-0980.

May 8-10, SOUTH DAKOTA ENVIRONMENTAL HEALTH ASSOCIATION meeting. To be held in Spearfish, South Dakota. For more information contact: Cathy Meyer, President S.D.E.H.A., PO Box 903, Mitchell, SD 57301. 605-996-6452.

May 14-16, CONFERENCE ON INFANT FORMULA, to be held at the Sheraton Beach Inn & Conference Center, Virginia Beach, VA. For more information contact: Dr. James T. Tanner, Food & Drug Administration, HFF-266, 200 C Street S.W., Washington, DC 20204. 202-472-5364.

May 20-23, FOODANZA '85, joint convention of the Australian and New Zealand Institutes of Food Science and Technology. To be held at the University of Canterbury, Christchurch, New Zealand. For more information contact: D. R. Hayes, Convention Secretary, 394-410 Blenheim Road, PO Box 6010, Christchurch, New Zealand.

May 21-23, INTERNATIONAL DAIRY FEDERATION SEMINAR, Progress in the Control of Bovine Mastitis, to be held at Bundesanstalt für Milchforschung, D-2300 Kiel, FRG. For more information contact: Prof. Dr. W. Heeschen, Bundesanstalt für Milchforschung, Institut für Hygiene, Hermann-Weigmann-Strabe 1, P.O. Box 1649, D-2300

Kiel / FRG. Telephone: (0431) 609-392 or 609-1. Telex: 292966.

June 23-26, CANADIAN INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY 28TH ANNUAL CONFERENCE, to be held at the Royal York Hotel, Toronto, Ontario, Canada. For more information contact: Mr. Bill Munns, Conference Chairman, Canada Packers Inc., 95 St. Clair Avenue W., Toronto, Ontario M4V 1P2, Canada. 416-766-4311.

August 4-8, IAMFES ANNUAL MEETING, to be held at the Hyatt Regency, Nashville, TN. For more information contact: Kathy R. Hathaway, IAMFES, Inc., P.O. Box 701, Ames, IA 50010. 515-232-6699.

August 25-30, 9TH SYMPOSIUM OF WAVFH. The World Association of Veterinary Food Hygienists (WAVFH) will hold their 9th Symposium in Budapest, Hungary. For more information contact: 9th WAVFH Symposium, Organizing Committee, Mester u. 81, H-1453 Budapest Pf 13, Hungary.

September 9-12, ASEPTIC PROCESSING AND PACKAGING OF FOODS, sponsored by The International Union of Food Science and Technology Food Working Party of the European Federation of Chemical Engineering, to be held in Tylosand, Sweden. For more information contact: Ann-Britt Madsen, Kurssekretariat, Lund Institute of Technology, P.O. Box 118, S-221 00 Lund, Sweden.

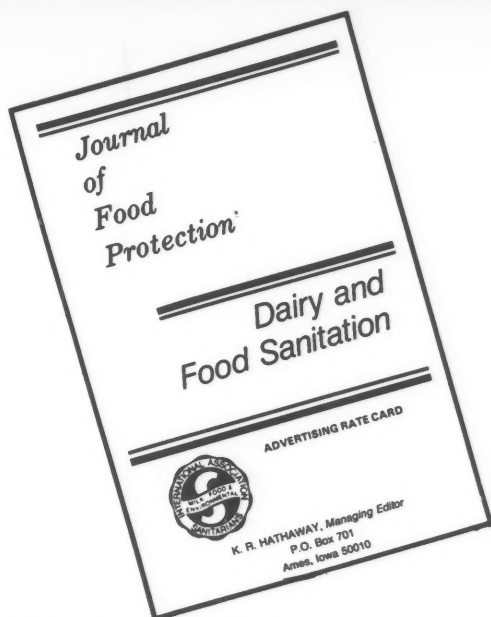
October 1-3, STORAGE LIVES OF CHILLED AND FROZEN FISH AND FISH PRODUCTS, to be held at The Conference Centre, University of Aberdeen, Aberdeen, Scotland. For more information contact: IIR Conference Organiser, Torry Research Station, PO Box 31, 135 Abbey Road, Aberdeen AB9 8DG, UK.

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April 14-18, FRUIT AND FRUIT TECHNOLOGY RESEARCH INSTITUTE INTERNATIONAL CONFERENCE to be held at the CSIR Conference Centre, South Africa. For more information contact: Symposium Secretariat S.341, CSIR, P.O. Box 395, Pretoria 0001, South Africa. Telephone: 012 869211 x 2063. Telex: 3-630 SA.

May 26-31, 2ND WORLD CONGRESS FOODBORNE INFECTIONS AND INTOXICATIONS will take place in Berlin (West) at the International Congress Centre (ICC). For more information contact: FAO/WHO Collaborating Centre for Research and Training in Food Hygiene and Zoonoses, Institute of Veterinary Medicine (Robert von Ostertag-Institute), Thielallee 88-92, D-1000 Berlin 33.

August 3-7, IAMFES ANNUAL MEETING to be held at the Radisson South, Minneapolis, MN. For more information contact: Kathy R. Hathaway, IAMFES, Inc., P.O. Box 701, Ames, IA 50010. 515-232-6699.



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CIRCULATION INFORMATION

Major Responsibilities

Milk/Food Quality Control	33%
Managers	16%
General Sanitation	21%
Laboratory	16%
Teaching - Research	5%
Industry	7%
Sales	2%
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