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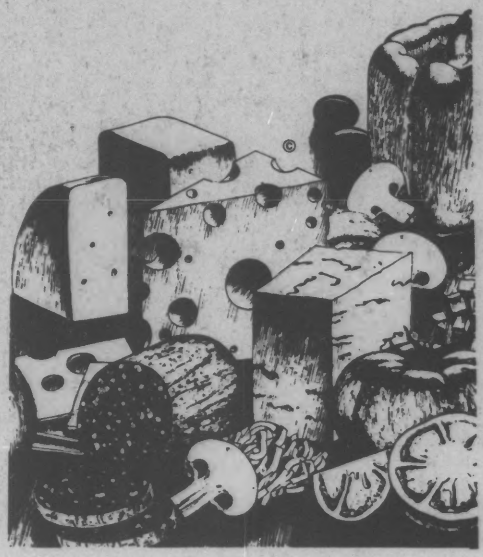

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Dairy and Food Sanitation

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Dairy and Food Sanitation, Vol. 5, No. 5, Pages 164-167 (May 1985)

The Components of an Effective Farm Inspection Program

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Dairy Farm Inspection programs are effective if the incidence of milk quality problems are reduced and dairy farms are asthetically pleasing to consumers. Effective programs include multiple components, none of which can be considered independently. Farm premises design and maintenance, laboratory support, milk grading, milk equipment function and regulatory enforcement all play important roles.

Processor or regulatory fieldmen can not conduct an effective program alone. Dairy producers must be convinced that it is in their best interest to offer for sale only milk that meets or exceeds the standards and is produced from well maintained premises. Dairy producers who make this realization become their own inspectors, often correcting potential problems before they become serious. Alberta's Milk Grade and Price Program has created this awareness.

In a consumer oriented market, milk quality can be maintained or improved by a combination of preventive maintenance by dairy producers, well stated and enforced consequences for non-compliance and a readily available source of information exchanged freely between field personnel and producers.

The dairy industry in Canada enjoys the enviable position in the mind of consumers and regulators, as being wholesome, safe and having a readily available supply of fresh quality product. An effective farm inspection program is an intregal part of maintaining this image.

The Canadian industry is broad and diverse. Each province has control over their own milk quality programs and they differ in design and application. This paper presents a Canadian perspective with emphasis on Alberta, where major progress toward the desired goal has been achieved.

PROGRAM GOALS

Effective programs include multiple components, none of which can be considered independently. As with any business we need to clarify the goals and purpose of the activity. We generally agree that a global objective would be to obtain the best possible milk from the farms with whom we deal. Secondly, to create a pleasing picture of dairy farms for consumers. A farm inspection program, whether conducted by industry fieldmen or regulatory agents, must have the focus of reducing the incidence of potential milk quality problems. To accomplish these goals the support and active involvement of dairy producers and producer organizations, processors, laboratory milk graders and regulatory agencies is required. Processor or regulators will never conduct an effective program, one that shows constant improvement in milk quality, without the support of all the stake holders in the industry.

KEY ELEMENTS

The key element is that of conscripting everyone who might have an influence on milk quality into becoming an inspector.

Our experience has been that when milk producers, processors and laboratory personnel were involved with the regulatory agent in the design of the milk quality program, that they remained committed to making it work. There was a considerable amount of education that transpired during the introductory period and the implementation of the Alberta Milk Grade and Price Program. Milk producers were given several opportunities through the written media, and public and private meetings to understand the program. Processors met on several occasions to discuss the implementation procedures and their implications to the industry. Laboratory staff were required to develop new techniques and refine existing ones. The ability of the Food Laboratory to transfer their technology to processor laboratories in the form of bench mark standards and cross reference data that improved inter-laboratory consistency, proved to be a most invaluable step.

ACTIVE INVOLVEMENT

The success of the Alberta Milk Grade and Price Program is based upon a premise that will work for any other program in any jurisdiction. The primary principle is active involvement with the entire industry which will lead to clearly stated standards, well understood and accepted objectives, established consequences of non-compliance action provided to all concerned, and enforcement of the program to all without regard to the reasons for poor quality milk.

Dairymen need to know what is expected of them. There are regulations or other guidelines in every jurisdiction, however, they are often interpreted differently by different sectors of the industry. Success will be found when everyone clearly understands which of the standards will be acted upon and how they will be enforced. Each inspector will apply the rules differently from each other and from farm to farm unless there is a concerted effort to standardize the implementation of the rules. When every dairymen knows what to expect from their fieldman, then and only then, will progress toward a common goal be made. Finally, when the processor fieldperson and the regulatory agent are carrying a similar message to dairymen, the objectives of milk quality improvement will be realized.

EQUALITY

Enforcement of standards to all on an equal basis is a fundamental principal of government, however, in application often it does not happen. We have found that when there is poor quality milk the reasons are not important. Milk of inferior quality should not find its' way into the system. Alberta producers have all been exposed to exactly the same standards. Enforcement of these milk quality standards was unique to none. Fieldpersons must not be overly aggressive in their approach to producers when attempting to bring about the desired change in conditions. There is need to bring reason to application of regulations. Field staff must always allow the producer a choice of action. The dairyman must be allowed to keep his self respect, self esteem and most important of all be allowed to save face by having a means to escape. Mutually agreeing upon completion dates and follow-up nearly always brings success.

LAB SUPPORT

Laboratories play an instrumental role in the success of a program. The objective data provided by a laboratory supplements the information available to field staff, producers and processors. As such laboratory reports save time in resolving problems, enlighten discussions and aides the inspection process. The monitoring process would not be economically possible without the laboratory. A laboratory can and must be used to confirm suspicious conditions or anticipated problems thus leading to proper recommendations. Without professional labortatory expertise, standards could not be established that are reasonable and enforceable. In Alberta's experience a well managed laboratory, either private or government, does instill a level of producer confidence necessary to the success of the program. Producers can be reassured that tests accurately reflect their milk quality and that if the same sample is tested in another laboratory the results will be comparable. This leads to having the producer closely examine his own operations as opposed to questioning the authenticity of the result.

MILK HAULERS

Bulk Milk Graders, those individuals who pick up milk from the bulk tank, and the milk receiver at the processing plant receiving the milk play an important role in milk quality. It is these people who see and taste the milk from every bulk tank in Alberta at least every other day. Any peculiarity that may exist is reported to both producer and processor. Milk cooling is such an important factor in shelf life that it can and is checked at every pickup by these graders. Therefore, another set of eyes exists that are involved in maintaining and improving milk quality.

ENGINEERS

Prior approval for building design or renovation and milking equipment installations is required in Alberta by legislation. This may appear to be restrictive legislation, however, it serves the purpose of prevention. Such as prevention of poor location, design and inadequate management practices. When a dairyman discusses plans with a field person they are forced to examine their own objectives and expected practices. Many possible problems have been eliminated by these discussions. The dairy farm equipment specialists test equipment for proper functions, make recommendations to producers and intervene between producers and equipment dealers to ensure that proper functioning milking equipment is not a contributing factor to poor milk quality.

FIELDPERSONS

The final partner in an effective milk quality program is the fieldperson. They are the guardian of the quality program, they are the enforcer, the educator, the change agent, the consultant and often the one who bears the most criticism when things go awry. The fieldperson must be an educated person who poses the ability to make intelligent judgements and offer plausible solutions. Technical competence to solve problems for dairymen is extremely important. A fieldman must possess missionary zeal, that desire to improve the lot of his fellow man as related to milk production. A demonstrated desire to be of service to the dairymen and to the industry serves well in opening communications with all segments of the industry, so necessary if progress is to be made. The fieldman who is emphatic to farmers interest but is loyal to their employer and the goals of the industry will be a welcome player in any milk quality program.

The approach and procedures employed by a fieldperson determines in part their success. Firstly, monitoring producer results is essential. Any change in milk quality must be followed up, confirmed and rectified immediately. This factor assisted greatly in Alberta's success, every poor quality result was followed up within a ten day period. When on the

farm a fieldperson's discussions must be kept succinct. Dairymen are busy people with little time for frivolous discussion. Comments either spoken or written must be kept brief, positive, specific to the issue and in a form that a producer can understand. Criticism must be issue specific and praise only directed at the personal level. Most of all the fieldperson must be consistent from farm to farm and day to day.

The farm visit that involves possible problems or known milk quality issues requires special tact. Problems must be identified before they become serious. Thus a fieldperson must gain the producers confidence and agreement that the objective of excellent milk quality is important. Next the process of identifying the problem is one that must be shown to the dairyman so as to teach him the skills that will allow him to solve future problems. If the process of having producers becoming their own inspectors is to be achieved, considerable effort in this educational role is required. As with any change agent, with the problem clearly identified, the alternative solutions must be determined between producer and fieldperson. The producer then can choose the one that best suits his management. When producers are clearly informed of the consequences of doing nothing or partially correcting the condition, in most cases they will choose the most reasonable alternative. Clear concise standards and well defined consequences carried out consistently will permit progress toward the quality goals.

ALBERTA'S PROGRAM

A description of the Alberta Milk Grade and Price Program may make it obvious how these principles of an effective farm inspection program were employed and how effective the program has become.

Early in 1981 discussions began with the milk producers of Alberta, milk processors and Alberta Agriculture regarding needed improvement in milk quality. Progress was made over the previous years, however, further improvements seemed impossible. When agreement in principle was reached by all parties involved, the details of the program were developed. Refinements to the administration have been developed via ongoing discussions with all segments of the dairy industry.

The program solicited some fundamental changes in laboratory testing and producer payment. Inhibitors in milk are an important health and economic problem. Therefore, screening bulk loads of milk prior to receiving at the processor was implemented. The rapid test methods employed, Charm and Penzyme, are more sensitive than our previous official test *B. Subtilus*. Our laboratories were extremely proficient in developing the technology necessary to utilize an official test using the *B. stearothermophilus* organism. This procedure alone made about a tenfold increase in sensitivity to inhibitors. In terms of payment of penalties or bonuses, regulations and procedures were developed to pay innocent producers whose milk was lost due to inhibitor contaminated loads, bulk milk haulers are compensated for disposal costs on these loads and any excess funds collected in any month are returned to all producers via their payment for milk delivered.

The standards for industrial milk were also reduced from 2,000,000 colonies of bacteria per millilitre to 200,000 colonies per millilitre as measured by the Standard Plate Count.

Present standards for milk in Alberta are SPC 75,000/ml (Fluid), 200,000/ml (Industrial). Freezing point $< -.530°$ H and no presence of inhibitors. Should a producers' milk exceed these standards they receive a lower grade for all their milk delivered during that month. The violation of these standards are kept on file using a 365 day period. The violations are cumulative thus leading to repeat violations being paid only 85% of the gross returns for the month in which the last violation occurs.

This very severe financial penalty for violators translates to a bonus for the remainder of the dairymen. The grade violations are administered equally to all. The producer knows exactly the quality expected of him, he knows the consequences of failure to comply, it is predictable as to the cost and when it will be applied and finally the margin or error is small enough that improved quality of milk occurs because of avoidance behavior towards the lower grade prices.

Non-compliance rates for bacteria counts had plateaued at about 10 percent prior to the introduction of the program. During the first year of operation that rate declined to 6.5% and 5.8% in the second year despite the reduced standard for industrial milk. An even greater improvement occurred at the upper end of the quality scale, 80.1% of samples were less than 20,000/m; in year one and 83% in year two, up from 76% previously. The percentage of violations for abnormal freezing points changed very little, remaining around 1 percent. The increased sensitivity of inhibitor testing plus plant screening of all loads could have increased the number of inhibitor violations. Much to the pleasure of everyone the rate of non-compliance in year one was 0.13% and 0.07% in year two. The previously quoted statistics are based upon every sample tested regardless if they were Bulk Milk Grader samples, official samples or confirmation samples. A further indicator of the magnitude of the success of the program is the number of producers with grade violoations; in the first year of operations there were 405, which declined to 194 during the second year of operation. I am pleased to report that even further progress was made during 1984.

Dairy producers are faced with increased pressure from the marketplace to improve the quality of their product. Milk quality standards assure that consumers receive dairy products of good quality and flavor, thus providing producers with increased milk sales. The dairy industry can maintain their very competitive position in the food and bever-

age market with continued enhancements to existing programs combined with constant vigilance over milk quality.

When all the components of a successful milk quality program are coordinated towards a common goal, progress will be achieved.

Dairy and Food Sanitation, Vol. 5, No. 5, Pages 168-172 (May 1985)

Instrumental Methods and Quality Control in Dairy Laboratories

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Paper presented at the 1983 Annual Meeting of IAMFES, St. Louis, MO.

In a recent paper published in the Journal of AOAC, Horwitz et al (5) stated that the quality assurance problem in food analysis is "how to prove to anyone, including ourselves, that we do report reliable analytical results." Generally speaking, quality assurance in an analytical laboratory refers to a system of inspection, analyses and decisions which take place in the laboratory from sampling to test report. The term "quality control" (QC) is a more restrictive concept because it applies only to the analytical process, including all the actions taken in and out of the laboratory in order to ensure that the measurement system is in control (2). A quality control program must give the assurance that the best possible analytical results are achieved by the laboratory.

This statement is valid for any analytical method, but in this presentation I will limit the discussion to the underlying principles which govern a quality control program applied to instrumental methods.

I will use as an example the instrumental methods used for assessing milk composition and quality for milk quality payment and breeding purposes.

1. Methods of milk analysis

Like many other fields, milk testing has changed dramatically during the past 10 or 15 years. The number and nature of tests performed regularly have increased and now, in many countries, large fully automated laboratories are using instrumental methods instead of the classical chemical or bacteriological manual techniques.

An instrumental method is a physical or chemical measurement process performed by a specific instrument. This includes techniques such as chromatography, spectroscopy, polarography, etc.

Instruments which are now used by dairy laboratories were primarily designed for milk analysis only, and are not usually directly applicable to the analysis of other foods, even other dairy products.

Three major methods, based upon the measurement of specific properties of milk components, are currently used to determine fat, protein, lactose and total solids contents in raw milk: dye-binding methods for protein testing turbidimetric measurement of fat based upon light-scattering by fat globules, and infra-red methods which measure the absorption of specific bonds or chemical groups of fat, protein, and lactose at given wavelengths.

Bacteriological quality is still measured directly by the standard plate count technique, either manually or with the help of fully mechanized equipment such as the Petri Foss for the preparation of Petri dishes and the electronic colony counters.

Several indirect methods based upon the measurement of bacterial activity or properties are currently under investigation by research laboratories: the measurement of ATP by bioluminescence, the direct fluorescent counting, the impedance measurement, etc.

The count of somatic cells is also another important criterium of milk quality, and now, for more than 20 years, electronic, optic, and fluorescent methods have replaced the direct microscopic method for routine analysis.

All of these instrumental methods have two important features which must be taken into account in a QC program: automation and indirect measurement.

1.1. Automation

Because an instrument can be easily automated, the term "instrumental method" is often used interchangeably with "automated methods." According to a definition given by the AOAC Committee on automated methods, a system or an apparatus is called automated when the operations are automatically controlled by mechanical or electronic devices that take the place of human organs of observation, effort and decision. In fact, some chemical or bacteriological methods, like the Kjeldahl method for nitrogen determination, or the standard plate count method for assessing bacteriological quality, can be fully mechanized, but the corresponding automated instruments should not be considered as instrumental methods.

1.2. Indirect measurement

Most, if not all, of the instrumental methods are also classified as indirect methods because they do not meas-

ure directly the component or property that they are intended to measure (e.g. milk fat content) but instead measure one or more quantities or properties of the product (e.g. milk turbidity) which are functionally linked to that component or property.

This is expressed by the relation: $Q = f(q_1 + q_2 + \ldots\ldots q_n)$ where Q is the quantity to be measured and q_n the quantities or properties actually measured.

Practically, to relate the signal given by the instrument to known quantitative values, the instrument must be calibrated against standard materials or reference methods which give the conventional true values.

2. Quality control program

Three different aspects of a QC program will be briefly discussed: method optimization, internal control and external control.

2.1. Method optimization

Method optimization may not be part of a QC program, but a general rule concerning a quality assurance program in an analytical laboratory ought to be the use of methods which have been first optimized and then validated by an official body: AOAC, APHA, ISO, or IDF for milk and dairy products.

Method optimization is the process of finding the optimum operating conditions of a method. According to Dols and Ambrecht (1) this process involves three stages: "obtaining a response, improving the response and understanding the response. Unfortunately, too often only the first stage is completed." This is particularly true for instrumental methods of milk analysis. For instance, it was known that the fatty acid composition of milk influenced the I.R. absorption at 5.73 microns. When the first instruments were used, it was generally assumed that the natural variation of fatty acid composition was not sufficient to alter significantly the accuracy of the analyses. Consequently, the laboratories did not pay too much attention to the variation in calibration of their instruments. However, significant discrepancies were rapidly accumulated between instrumental and reference data. Further studies (4,6) showed clearly the importance of natural variations of fatty acid composition and their consequences on the accuracy of the analyses.

2.2 Internal control

2.2.1. Repeatability: Repeatability is the first check which has to be carried out, because it is the simplest test indicating whether the instrument is working properly. Quantitatively, repeatability measures the closeness of agreement between successive results obtained under the same conditions (same instrument, short period of time). Because routine analyses are not performed in duplicate, repeatability should be checked every time the instrument is going to be used.

2.2.2. Daily and short term stability: Instrument response is very often sensitive to variations in power supply and environmental conditions, and therefore, instrument stability should be checked continuously. This is usually done by means of internal standards. In fact, internal standards have a dual purpose: 1) to check the stability and 2) to calibrate the instrument. In milk analysis, these two functions are preferably dissociated and a control milk is used for monitoring the stability of the instrument. One of the advantages of a control milk over a standard solution, like butyrolactone for I.R. fat testing, is that the milk sample follows all the various steps of the analytical process, in this way checking the entire process, whereas the standard solution checks only the optical system, leaving some important aspects like sample mixing and homogenization out of the control.

2.2.3. Recording and use of control data: Each laboratory has its own philosophy about how to use control data, what deviation can be tolerated and what action has to be taken. Frequently, a tolerance of ± 2 standard deviation of repeatability around the reference value is accepted and, as long as individual results of the control milk remain within the tolerance interval, the instrument is supposed to work well. Very few laboratories draw statistics from their records and sometimes control data are not even written down. Such practices are not acceptable in a QC program. To monitor the instrument stability over a working day, a control chart based upon the principles used routinely by the industry to monitor output of production lines can be used. Instrumental automatic methods have the advantage over less rapid techniques in that many results come out during a short period of time, making possible the use of sound statistical principles. The major interest of a control chart is to display data in time order and to allow simultaneous statistical calculations while the instrument is operating.

Figure 1 shows how a control chart can be done and how it works. There is one straight line in the center, corresponding to the reference or target value of the control milk. This value (fat or protein content, for instance) must be determined very carefully each time a new batch of control milk samples is prepared.

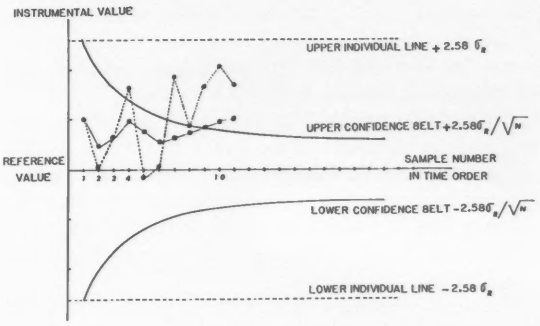

Figure 1. *Control chart for instrumental methods*
R: standard deviation of within day reproducibility
N: Number of control milk samples analyzed
●: *individual results*
■: *cumulative mean of results*

- One lower and one upper "confidence belt" which correspond to a given probability of the two-sided confidence limits of the cumulative mean of the control milk. In order to avoid too frequent and unnecessary adjustment of the instrumental signal, a 1% probability level is used.

- One lower and one upper "individual line" which correspond to the probability of the two-sided tolerance interval of individual test results. A 1% probability level is also used here.

Action should be taken when:

1) The cumulative mean is, for two consecutive samples, outside the same upper or lower confidence belt, indicating that the instrument is drifting or that the milk sample quality is deteriorating.

2) Individual results fall frequently near or outside both individual lines, indicating a poor repeatability or poor milk sample quality.

In each case, the operator must stop and check the instrument functions and, if necessary, readjust the calibration. Depending upon the type of instrument, the calibration function should normally be modified only when major parts of the intrument have been changed or serviced or when, as we will see later, the average physico-chemical properties of the milk samples which are analyzed have changed because of the season, the feeding conditions, etc.

2.3.4 Accuracy: Besides limiting the sources and the importance of random errors, the laboratory must avoid systematic errors to give analytical results which are as close as possible to the "true value." Indirect instrumental methods of milk analysis can yield different kinds of systematic errors:

Figure 2A shows the ideal situation for an indirect method, where the plot of the reference vs. the indirect results gives a straight line passing through the origin with a slope of 1.000. All the data points, which are the average of replicates, are located on the line, and at each level the instrumental value equals the reference value.

The ellipse in Figure 2B represents a population of milk samples analyzed by the reference method and by the instrument which is, this time, not correctly calibrated. The observed line is obtained from the regression of reference vs. indirect results.

For a given sample (S) the difference between the indirect and the reference values, 3.00 - 2.90 = 0.10%, can be split into two components or two distances: the distance from the point (S) to the actual regression and the distance from the regression to the theoretical line, this latter distance represents the calibration error at the 3.00% level.

Figure 2C shows the same situation, but the instrument is now perfectly calibrated. The observed line and the theoretical line are now confounded, eliminating the calibration error not only for the sample S but for all the sampled population.

The indirect value, which was shifted from 3.00 to 2.95% by adjusting the calibration, still does not match

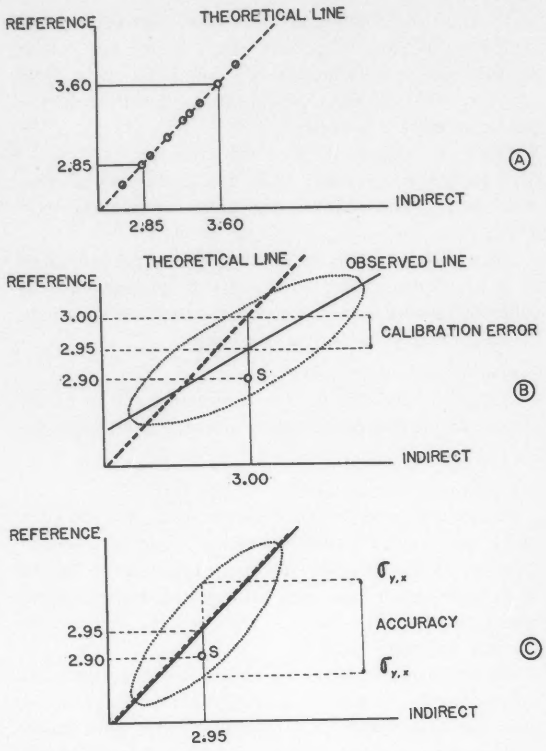

Figure 2. *Breakdown of the accuracy of the mean of an indirect method of analysis.*

the reference value of 2.90%. The difference between the 2 methods (0.05) is closely associated with the particular physico-chemical characteristics of the sample S and represents the matrix effect.

From the property of the s.d. from the regression ($\sigma_{y,x}$), 95% of the population of samples lie within the tolerance interval of $\pm 2\ \sigma_{y,x}$. This value represents an important attribute of the method: the accuracy. Its magnitude will depend on the degree of homogeneity of the milk population, i.e. it will be better for herd milk than for individual milk. From this example we can see that only one fraction of the original systematic error can be eliminated by an appropriate calibration, and the laboratory should know what accuracy can be expected with the type of instrument used and with the nature of milk samples analyzed.

Instrument calibration is usually done simply by using standard reference solutions or materials. This is possible only when the analyte is available in pure form and when the influence of the matrix of the product is negligible. In the case of complex compounds like milk fat or protein, or biological materials like somatic cells or bacteria, the calibration has to be done against a reference method, because the pure components are not available and because of a significant matrix effect represented by the average physico-chemical properties of the milk samples.

There is a necessity of constantly using a reference method for economic and regulatory reasons. When measuring fat and protein, no difference is acceptable between the test results of the milk components used as a raw material (input) and those obtained by other methods of analysis on the end products, cheese, butter, whey, powder, etc. (output). A single chemical reference is therefore essential for both raw milk and end-products analysis. Furthermore, in many countries mandatory regulations state that the instrumental results given by milk testing laboratories should be, within specified limits, always in agreement with the official reference method.

For these internal operations the laboratory should keep record of all the analytical results and all the modifications of the instrument setting. In a recent paper on quality assurance, Dux (2) emphasized that "if you don't write something down, you didn't do it." Now with the advance of micro-computers, more laboratories are using electronic devices to perform a stability check and calibration. Such equipment is very helpful and must be encouraged, but we must also emphasize that automatic correction of results is strongly prohibited in order to avoid giving "correct" results while the instrument is not working properly.

2.3. External control

An external voluntary or mandatory control of quality implies the participation of another laboratory which may be a governmental laboratory or the R and D central laboratory for a company.

The most common form of external quality control is the interlaboratory study where the participating laboratories are asked to test one or more specific components or properties by one or more methods of analysis and to report their findings to the organizing laboratory. Details concerning the objectives, design, sample preparation and statistical evaluation can be found in several publications, and especially in the AOAC book on collaborative studies.

Several benefits can be expected from participation in interlaboratory trials:

1) It indicates to the laboratory where their average results stand compared to other laboratories, providing thus a strong point of reference. "It is good in terms of preventive medicine helping a healthy laboratory to stay very well." (7)

2) Experience has shown that after a few years of participation, the between-laboratory variance decreases significantly, improving the homogeneity of results between laboratories.

In an IUPAC seminar on the harmonization of collaborative studies (3) we have already pointed out that the application of collaborative studies to instrumental methods of milk analysis have some limitations. If the study is conducted in standard conditions where each participating laboratory calibrates its own instrument against its own reference values, using its own set of milk samples, the between-laboratory variance will therefore include three sources of error: the instrument reproducibility, the reference method reproducibility and the influence of the origin of milk samples. In these conditions, a proficiency test should also include the analysis of samples by the reference method in order to detect the possible influence of the origin of milk.

A collaborative study can also be conducted with "unknown" samples and the laboratory is not aware that the same set of samples is going to be analyzed by a central laboratory or by other laboratories. This is a more realistic proficiency test because in such cases laboratories usually do more poorly than in a carefully controlled study, likely indicating an inefficient internal quality control program.

Besides these conventional controls and whenever it is possible, an on-the-spot inspection by competent persons is also important, because it is the best way to pinpoint present or potential sources of error. To be fruitful, an inspection or visit should be followed by discussion and advice.

Table 1 shows an example of the external QC program applied in France to about 50 dairy laboratories testing fat and protein contents, bacteriological quality and somatic cells count for milk payment and breeding purposes. This program implies the participation of one central laboratory which checks regularly the accuracy of test results by the reference methods (Gerber, Kjeldahl, Direct microscopic somatic cell count) and which prepares and forwards once a month to the routine laboratories two sets of standard milk samples for checking the calibration of their instruments. One set is for the calibration of the amido black method, used locally as a secondary reference method for protein calibration of IR instruments, and one set is for the calibration of somatic cells counting instruments (Fossomatic, Coulter).

Finally, a QC program cannot be satisfactory without a continuous training program, especially in the field of instrumental analysis where techniques become rapidly obsolete, and even if the basic principles of the methods remain the same, there is always new modified equipment appearing regularly on the market.

SUMMARY

In most countries with a developed dairy industry, milk supplies are tested regularly for milk payment or regulatory purposes, by specialized laboratories using mainly automated equipment.

The infra-red method is now widely used for measuring fat, protein and total solids content, and electronic equipment has replaced the microscope for somatic cell counting. Standard plate count is still used for the evaluation of bacteriological quality of raw milk, but several new methods (fluorescence, impedance, A.T.P. measurement, etc.) might be used shortly.

Because indirect instrumental methods require calibration against reference methods or materials, the overall accuracy is closely associated with the ability of the laboratories to perform reference methods correctly, or with the availability of standard reference materials.

TABLE I. *External quality control program applied in France to routine dairy laboratories for milk payment and dairy herd improvement programs.*

NATURE OF CONTROL		ANALYSIS		FREQUENCY
DESIGN	PURPOSE	Component	Method	
1. Each routine lab sends one milk sample to the central lab.	Comparison of results between each routine lab and the central lab.	fat protein	Gerber Amido Black	2/mo
2. Interlaboratory study				
• Known samples	assessment of the between laboratory variance.	fat protein	Gerber Amido Black	1/yr
		Bacterial count Somatic cells	Plate loop Instrumental methods	4/yr
• Unknown samples	Proficiency test. Comparison between instrumental results (routine lab) and: reference results (central lab).	fat	Gerber (central lab) Instruments (routine lab)	4/yr
		protein	Amido Black (central lab) Instrument (routine lab)	

High quality results can be achieved, provided that the laboratories are aware of the limitations of the methods, and apply a quality control program. Internal control should include regular checking of precision, accuracy and stability of the instruments. An external surveillance is also essential to ensure homogeneity of results between laboratories.

REFERENCES

1. Dols, T. J., and B. H. Armbrecht. 1982. AOAC Working Document K.
2. Dux, J. P. 1983. Quality assurance in the analytical laboratory. American Laboratory, *15*, 54-63.
3. Grappin, R. 1981. Definition of accuracy and application of collaboratives studies to indirect instrumental methods of milk analysis. View of the International Dairy Federation. In "Collaborative interlaboratory studies in chemical analysis." Ed. by H. Egan and T. S. West, Pergamon Press, Oxford.
4. Grappin, R., and R. Jeunet. 1972. Facteurs biologiques responsables des variations observées dans la précision des méthodes de routine utilisées pour le dosage de la matiére grasse du lait. Le Lait, *52*, 324-346.
5. Horwitz, W., R. K. Laverne and W. B. Kenneth. 1980. Quality assurance in the analysis of foods for trace constituants. J. Assoc. Off. Anal. Chem., *63*, 1344-1354.
6. Sjaunja, L. O. 1982. Studies on milk analysis of individual cow milk samples. Report 56. Swedish University of Agricultural Sciences. Uppsala.
7. Wilson, M. E. 1975. Microbiological proficiency: what basis for confidence? in "Quality Control in microbiology." Ed. by J. E. Prier et al., University Par Press, Baltimore, MD.

Dr. Joseph C. Olson - 1985 Recipient of the Harold Macy Award.

1985 Recipient of the Harold Macy Award

Dr. Joseph C. Olson has been selected as the 1985 recipient of the Harold Macy Food Science and Technology Award. The Macy Award has been presented annually since 1981 by the Minnesota IFT Section in recognition of an outstanding example of food technology transfer or of cooperation between scientists in any two of the following settings: academic, government and private industry.

Dr. Olson, who is currently working as a food microbiology consultant, was Director of The Division of Microbiology, Bureau of Foods, Food & Drug Administration, from 1967 to 1969. Prior to that he was on the faculty at the University of Minnesota. He now resides in Sun City, Fl.

Dr. Olson was co-convenor of the International Symposium on Sub-Leathally Impaired Bacterial Cells in Mexico in 1970, and as a member of the National Academy of Sciences - National Research Council, he helped to prepare a national policy for establishment and application of microbiological criteria of foods.

Dr. Olson has also been active in the publication of the well-known "Compendium of Methods for the Microbiological Examination of Foods", and served as Editor of the Journal of Milk and Food Technology from 1951 to 1967.

Through Dr. Olson's initiatives, much has been done to improve food safety and hygiene throughout the world.

Ice Cream for America Campaign

Ice Cream, America's favorite dessert and snack food, will once again be the focus of the third annual ICE CREAM FOR AMERICA campaign during July, National Ice Cream Month.

Plans for the program, sponsored by the International Association of Ice Cream Manufacturers (IAICM), were announced by co-chairman Kenneth J. Douglas, chairman of Dean Foods, Chicago, Illinois, and John F. Garber, Jr., president of Penn Dairies, Inc., Lancaster, Pennsylvania. They promised the largest program yet in the three-year history of ICE CREAM FOR AMERICA, with extensive national and local publicity and advertising, and marketing and merchandising support designed to keep ice cream on America's shopping lists and fully stocked in their freezers.

The Dairy Board was established by Congress in the fall of 1983 to develop a coordinated national program to promote milk and dairy products. IAICM members are planning to respond to this support by greatly increasing their companies' advertising expenditures.

New Consolidated Standards Publication Released

A new publication outlining specific sanitation procedures for food storage warehouses titled, *Consolidated Standards for Food Distribution Centers*, has just been released by the Sanitation Education Department at the American Institute of Baking.

According to Bill Pursley, Director of Sanitation Education at the Institute, "This new publication is unique. It provides a quick and comprehensive overview of what food product safety programs in warehouses should include." Pursley added, "You'll find a compendium of food processors storage and distribution system in this new publication. It provides a lot of helpful information that will enable managers of warehouses to keep their facility operating within regulatory guidelines.

The reference standards are based on the Food, Drug, and Cosmetic Act; the umbrella Good Manufacturing Practice regulations; the Federal Insecticide, Fungicide and Rodenticide Act; and the AIB Rating System. Consolidated Standards for Food Distribution Centers is not in the typical 'how-to' format, it is a specific list of recommended procedures that must be practiced in order to comply with all applicable regulations on a preventive rather than reactionary level.

Outlined and explained in the publication is AIB's Rating System for Food Distribution Centers, Adequacy of the Food Safety Program, Pest Control, Operational Methods and Personnel Practices, Maintenance for Sanitation, Cleaning Practices, and Conditions for the Automatic Unsatisfactory Rating. In addition, samples of important record sheets for

Master Sanitation Schedule, Pesticide Usage Log, Restricted Pesticide Purchase Record, and Incoming Ingredient Examination Record and Refrigerator/Freezer Control Record are included.

Price for the Consolidated Standards for Food Distribution Centers has been set at $5.00 for AIB field inspection program subscribers and $10.00 for those not subscribing to the field inspection program. Price includes postage and handling.

For more information contact: Bill Pursley, American Institute of Baking, 1213 Bakers Way, Manhattan, Kansas 66502, 913-537-4750.

Researchers Determine Conditions For Extending Shelf-Life of Fish

Consumers in the Midwest can now enjoy fresh ocean fish from their local supermarkets, and mid-Atlantic seafood processors can enjoy the profits resulting from an expanded market area. Virginia Tech food science researchers have determined that if fish are handled and processed properly they will stay fresh for 12 days, long enough to be attractive to inland retailers.

An extensive study of the handling and processing of fish from the east to the supermarket was financed cooperatively by the Mid-Atlantic Fisheries Development Foundation Inc., the Kroger Company and the Virginia Sea Grant Consortium.

Robert Samuels, Arthur DeFeo, and Donn Ward of the Seafood Processing Research and Extension Unit in Hampton, Va., and George J. Flick, professor of seafood technology at Virginia Tech, studied all aspects of fish handling and processing - on board fishing vessels, in processing plants, and in trucks carrying and delivering the product to distant markets. They evaluated existing conditions and also determined optimum temperatures and handling techniques for the production of high-quality, long-lasting final products. The shelf-life of fish processed by standard techniques was compared to that of fish prepared with strict sanitation and temperature controls.

Conditions at the processing plants were found to have more of an impact on the quality of the fish than those on the fishing vessels. The researchers evaluated several processing plants and made specific recommendations to ensure production of high quality products. The first step is to accept only high quality incoming fresh fish for processing. Then, comprehensive sanitation procedures and strict temperature controls at every stage of the processing operation are essential. Trial use of a high-pressure wash on the whole fish before and after the scaling operation resulted in reduced bacterial counts on the fish. In addition, the use of modified atmosphere packaging techniques showed tremendous potential for extending shelf-life of quality fresh fish, given optimum temperature controls.

Transportation and distribution can also affect product quality. Again, temperature control is of primary importance. Adequate icing of fish in cartons or stringent control of trailer temperatures for tray-packed fish without ice is essential. Temperature abuse can occur at distribution points if products are left unattended. Contamination can also occur during distribution, from other food products or from unsanitary conditions.

The results of this study should be considered by anyone who is interested in production and sale of fresh fish to inland markets.

New Food Ingredient Technology Workshop

A workshop on new food ingredient technology by the National Food Brokers Association will be held June 8 at the Hilton Towers Hotel in Atlanta before the annual meeting of the Institute of Food Technologists.

New technical developments and new directions in food quality protection will be covered in these annual sessions, which bring together food technologists and marketers, to analyze marketing opportunities as each technological advance is studied.

Those wishing to participate should contact NFBA at 1010 Massachusetts Ave., N.W., Washington, D.C. 20001, 202-789-2844, to obtain registration materials for the industrial workshop.

Increased Enrollment In SCC Program

The dairy industry's commitment to increase consumption of dairy products apparently coincides with dairy farmers' commitment to produce better quality milk.

The recent 1,000-herd increase in enrollment in the state's Dairy Herd Improvement Somatic Cell Count (SCC) program could ultimately improve milk quality and strengthen the dairy industry's marketing efforts, says Allan Bringe, dairy scientist with the University of Wisconsin Cooperative Extension Service.

It will also bolster profit margins on dairy farms.

Bringe says top-quality dairy products which meet consumer preferences require milk from cows with four healthy quarters. Fortunately, this is the most profitable milk to produce. Experts estimate that, on the average, each case of subclinical (hidden) mastitis

decreases milk production by 1,000 to 2,000 pounds per lactation.

The SCC program is the only way to identify infected cows to stem those losses and improve milk quality.

Dairy farmers should try to produce milk with somatic cell counts of less than 200,000, Bringe says. That's a tall order, but approximately 15 percent of the dairy farms now enrolled in Wisconsin's SCC program do so consistently.

Bringe says low somatic cell counts result when mastitis organisms are kept from the mammary gland through good sanitation, a good environment for dairy cows, proper installation and maintenance of milking equipment, the right milking procedures, and somatic cell counts which identify infected cows.

Increased enrollment in the SCC program is a significant development, particularly since reduced milk support prices have encouraged some dairy farmers to "economize" by cutting recommended practices such as artificial insemination. More dairy farmers have apparently learned that the SCC program usually returns at least $5 for each dollar invested, Bringe adds.

Safety Of Aspartame (Nutrasweet) Confirmed

Extensive scientific testing has shown aspartame (NutraSweet) to be a safe food ingredient. With the exception of individuals with phenylketonuria (PKU) or other rare medical problems which require a low-phenylalanine diet, everyone - both adults and children - can consume aspartame safely. So states the new report *Low-Calorie Sweeteners* published by the American Council on Science and Health (ACSH), an independent scientific organization.

"After aspartame became available in the U.S., there was a lot of talk about whether there might be hazards associated with it," said ACSH Research Associate Kathleen A. Meister, author of the new report. "Several different safety questions were raised, and some people said that these were new questions that had never been looked at before."

"When we examined the scientific evidence on aspartame, we discovered that the safety issues people have been talking about during the past year or so were not new at all," Mrs. Meister continued. "They had been recognized and evaluated during the very comprehensive testing program that aspartame went through before it was approved, and the tests had shown that there were no real safety problems."

"Aspartame is just as safe in the summer as it is at other times of the year, despite rumors to the contrary," said ACSH Associate Director Dr. Richard A. Greenberg. "The rumors are based on a misunderstanding about the chemistry of aspartame. It's true that aspartame in a beverage may break down into its components if it's stored too long at a high temperature. But all this does is make the drink less sweet than it's supposed to be; it doesn't cause a health hazard. Aspartame's components aren't dangerous in the amounts that we could possibly consume, and it makes no difference whether aspartame breaks down in the soda can or in your digestive tract."

"Few people realize how difficult it is for a new food additive to be approved in the 1980's" said ACSH Executive Director Dr. Elizabeth M. Whelan. "Today's scientific standards are very stringent. The Food and Drug Administration requires extensive safety testing and then evaluates the results of those tests very carefully. Few substances have undergone as much safety testing as aspartame has, or survived such intense scientific scrutiny."

There have been reports that a few people have experienced side effects after consuming aspartame. "The federal health agencies are investigating these incidents," Dr. Whelan said, "and so far they haven't uncovered any problems clearly attributable to aspartame. It appears that what we have here are coincidences rather than cause-and-effect relationships. No real side effects have been discovered in Canada, either, where aspartame has been used in soft drinks for two years longer than it has in the U.S."

The American Council on Science and Health is an independent, nonprofit consumer education organization promoting scientifically balanced evaluations of food, chemicals, the environment and health.

A single complimentary copy of *Low-Calorie Sweetners* can be obtained by sending a stamped (37¢ postage), self-addressed, business-size (#10) envelope to Low-Calorie Sweetener Report, ACSH, 47 Maple St., Summit, NJ 07901.

Davis Calvin Wagner Sanitarian Award

The American Academy of Sanitarians is pleased to announce the fifth annual Davis Calvin Wagner Award. The Award, which will be presented in June at the Academy's luncheon held during the Annual Educational Conference of the National Environmental Health Association in Las Vegas, NV will consist of a plaque and a $500 honorarium. The Award is open to all Diplomates of the Academy. The recipient should be one who:

1. Exhibits resourcefulness and dedication in promoting the improvement of the public's health through application of environmental health and public health practices,

2. Demonstrates professional, administrative and technical skills and competence in applying such skills to raise the level of environmental health,

3. Continues to improve oneself through involvement in continuing education type programs to keep abreast of new developments in environmental health and public health,

4. Is of such excellence as to merit academy recognition.

Walker Computerizes Repair Parts Order Processing

Repair parts ordered from Walker Stainless Equipment Co. are now shipped consistently within 24 hours after receipt of a customer's order.

This excellent turn around time is now possible due to computer listing of all repair parts. In addition, the company has increased inventories, consolidated and organized stock parts in a new expanded plant facility. Incorporation of the latest data processing systems, stock handling and optimum layout arrangement permits fast, accurate 'off the shelf' parts availability to customers and distributors.

The new data processing system and improved, expanded storage and shipping facilities were initiated to reduce customer downtime and increase shipment reliability.

Walker Stainless Equipment Company fabricates stainless steel liquid food transport tanks, bulk milk pick-up tanks, storage and silo tanks, processing equipment, components and systems for food, beverage, pharmaceutical, cosmetic and dairy industries.

General offices are located at New Lisbon, Wisconsin with plants at New Lisbon, Wisconsin, Elroy, Wisconsin and Tavares, Florida.

SCM to Acquire Baltimore Spice Company

SCM Corporation and the Baltimore Spice Company have agreed in principle for SCM to acquire Baltimore Spice for an undisclosed amount.

Baltimore Spice creates specialized seasonings and high purity industrial spices for the food processing industry, including meat packers, canners, frozen food, snack foods, salad dressing manufacturers, bakeries and others. Domestic sales are approximately $40 million annually.

Baltimore Spice will become part of Durkee Foods, a leading manufacturer of specialty edible oils, shortening systems, emulsifiers, fractionated products and food chemicals for the food processor and foodservice industries. Together with Durkee Famous Foods, a leading supplier of consumer spices, sauces and food specialties, SCM Foods sales were $393 million in fiscal 1984.

Ralph Brunn, president of Baltimore Spice, said, "Becoming part of SCM will provide a strong base for the continued development and growth of our business, and this is in the best interests of our employees, suppliers and customers." Mr. Brunn will continue to manage the business, reporting to Ron Bowen, president of SCM's Durkee Foods division.

Advertising and Nutrition Claims

Consumers can be easily misled by food advertising that plays on their concerns about calories, cholesterol and sugar, says a Texas A&M University Agricultural Extension Service nutritionist.

Advertising is regulated by the Federal Trade Commission, and cannot contain incorrect information, says Dr. Alice Hunt. But some advertising claims take advantage of consumers' lack of nutrition information.

Many products are labeled "light" or "lite" to capitalize on consumers' interest in lower calorie foods, she says. While these products may be lighter in color or taste, they often have the same number of calories as other brands of the same product.

The labels on some vegetable oils, margarines and peanut butters state they have "no cholesterol." "Unfortunately, many consumers don't know that cholesterol is found only in animal products, so a vegetable product wouldn't contain it anyway," says Hunt.

These consumers may also mistakenly assume that similar vegetable products contain cholesterol, simply because their labels do not claim otherwise, she adds.

Consumers trying to cut down on sugar may be misled by similar advertising. For example, some brands of orange juice claim to have "no sugar added." This implies that other brands do have sugar added.

Yet under federal standards, any product labeled "orange juice" must be 100 percent orange juice with nothing added," explains the nutritionist.

Products advertised as having "half the sugar," may or may not have less sugar than other brands, Hunt points out. Often the product has fifty percent less sugar than it did before, but it may still contain a high amount of sugar.

Advertising can provide some valuable and useful information, she says. But to avoid being misled, consumers must become informed about nutrition and take the time to carefully read the labels on food products.

Water Filters

A water filter on the kitchen faucet can give you a better tasting glass of water, but it won't solve all water quality problems.

Before buying an activated carbon water filter, consumers should be aware of what it can and can't do for them, says Texas A&M University Agricultural Exension Service home economist Bonnie L. Piernot.

"One thing a filter will not remove is bacteria - that's a job for a water purifier," she says. "By law, a device that claims to remove bacteria must prove its effectiveness in specific tests before the U.S. Environmental Protection Agency (EPA) will allow it to be called a purifier."

In fact, there is some concern that the wet carbon in filters can make a good breeding ground for bacteria, says Piernot, especially when the filter is not used for a while and after it has treated a large quantity of water.

Activated carbon filters will not remedy hard water; watersoftening devices are needed for that. They also have little effect on dissolved metals, hydrogen sulfide, chlorides, fluorides or nitrates, she says. A reverse osmosis unit or ion exchange device is needed to remove such chemicals and minerals.

In spite of these limitations, an activated carbon filter can remove rust particles and improve water quality by effectively removing many objectionable tastes and odors, she points out.

It can also help clear sediments from tap water. Many home filtering units can even remove some organic chemicals such as pesticides.

According to Piernot, appropriate use and maintenance of a home water filter is essential for good performance. Here are some suggestions:

- Flush out the filter before the first use of the day. Open the faucet wide and let the water run at least 30 seconds for an undersink model, and at least 10 seconds for a sink-mounted filter. When you install a new cartridge, flush for several minutes to remove fine carbon particles.
- Change filters regularly. A heavily used filter is more likely to contain high bacterial levels and to discharge organic chemicals previously trapped.
- Don't filter hot water. A filter that passes hot water won't remove contaminents very well, and the hot water may liberate chemicals previouly trapped on the filter.
- Use the slowest flow rate you can. The longer the water is in contact with the filter, the more impurities the carbon can attract and the cleaner the water will be.
- After installing a new cartridge, circle on your calendar the date for the next replacement and then stick to your schedule.

PROGRAM
Seventy-Second Annual Meeting
International Association of
Milk, Food and Environmental Sanitarians, Inc.

In Cooperation with the
Tennessee Association of Milk, Water and Food Protection
August 4-8, 1985

Hyatt Regency **Nashville, Tennessee**

REGISTRATION TIME

Saturday, August 3 - 1:00 PM - 5:00 PM - Davidson A
Sunday, August 4 - 12:00 Noon - 5:00 PM - Ballroom Foyer
Monday, August 5 - 8:00 AM - 5:00 PM - Ballroom Foyer
Tuesday, August 6 - 8:00 AM - 5:00 PM - Ballroom Foyer
Wednesday, August 7 - 8:00 AM - 12:00 Noon - Ballroom Foyer

REGISTRATION FEES

	Advance	At Door
Registration Fee-Member	$30.00	$35.00
Registration Fee-Non-Member	$40.00	$45.00
Student	No Chg.	No Chg.
Partner	$10.00	$12.00
Tennessee Hoedown	$20.00	$22.00
Banquet	$20.00	$22.00

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SATURDAY - AUGUST 3, 1985

12:00 Noon - 5:00 PM	Local Arrangements Committee - Davidson A
1:00 PM - 5:00 PM	Executive Board
5:30 & 8:30 PM (6:30 & 9:30 show time)	Grand Old Opry Shows (*transportation provided*)

SUNDAY - AUGUST 4, 1985
Afternoon

12:00 Noon - 5:00 PM	Local Arrangements Committee - Ballroom Foyer
1:00 PM - 5:00 PM	Executive Board - Suite 7B
1:00 PM - 5:00 PM	Partner Hospitality - Davidson B
1:00 PM - 4:00 PM	Farm Methods Committee - Suite 4
1:00 PM - 5:00 PM	Communicable Diseases Affecting Man Committee - Suite 5A
1:00 PM - 3:00 PM	Food Equipment / Sanitary Standards - Suite 5B
1:00 PM - 3:00 PM	Journal of Food Protection Management Committee - Suite 6A
3:00 PM - 5:00 PM	Council of State Sanitarians Registration Agencies Committee - Suite 7A
3:00 PM - 5:00 PM	Nominations Committee - Suite 5B
3:00 PM - 5:00 PM	Dairy and Food Sanitation Management Committee - Suite 6A

SUNDAY - AUGUST 4, 1985
Evening

6:00 PM - 8:00 PM	Early Bird Reception

MONDAY - AUGUST 5, 1985
Morning

8:00 AM - 10:00 AM	Sanitarians Joint Council - Suite 4A
8:00 AM - 10:00 AM	IAMFES Membership Committee - Suite 6A
8:00 AM - 10:00 AM	Scientific Paper Committee - AV Room
8:00 AM - Noon	Applied Laboratory Methods Committee - Suite 5
8:00 AM - Noon	Partner Hospitality - Davidson B
8:00 AM - Noon	Executive Board - Suite 7B
8:00 AM - 5:00 PM	Local Arrangements Committee - Ballroom Foyer
10:00 AM - Noon	Baking Industry Sanitary Standards Committee - Suite 7A
10:00 AM - Noon	Council of Affiliates - Suite 6A
11:30 AM - 1:00 PM	Tennessee Affiliate Meeting - Davidson A

MONDAY - AUGUST 5, 1985
Afternoon
General Session - Regency Ballroom I&II
Sidney E. Barnard, Presiding

1:00 PM	DOOR PRIZE
1:35 PM	INVOCATION - Ray Rottero
1:40 PM	WELCOME - Ruth Fuqua
2:00 PM	PRESIDENTIAL ADDRESS - Archie Holliday
2:30 PM	KEY-NOTE ADDRESS - Maurice Kinslow, Director, Region IV FDA, Atlanta, GA
3:00 PM	MILK BREAK
3:15 PM	DOOR PRIZE
3:20 PM	BUSINESS MEETING - Archie Holliday, President 1. Report of Secretary-Treasurer 2. Report of Executive Manager 3. Committee Reports 4. 3-A Symbol Council Report 5. Report of Resolutions Committee 6. Report of Affiliate Council 7. Old Business 8. New Business

9. Report of Nominating Committee

MONDAY - AUGUST 5, 1985

6:00 PM Tennessee Hoedown

TUESDAY - AUGUST 6, 1985
Morning - Food Sanitation Session - Regency 1
Dr. A. Richard Brazis, Chairman

8:25 AM DOOR PRIZE

8:30 AM BULK MERCHANDISING OF FOOD - Tom Gable, National Sanitation Foundation, Ann Arbor, MI

9:00 AM MICROBIOLOGICAL QUALITY OF BULK VERSUS PACKAGED FOODS IN RETAIL MARKETS - J.W. Hastings* and L.B. Bullerman, University of Nebraska, Lincoln, NE

9:20 AM MICROBIOLOGICAL AND SENSORY TESTS OF BEEF TREATED WITH VOLATILE FATTY ACIDS - M. Bell, R.T. Marshall* and M.E. Anderson, University of Missouri, Columbia, MO

9:40 AM BACTERIOPHAGE CONTROL OF BEEF SPOILAGE - G. Gordon Greer, Agriculture Canada Research Station, Lacombe, Alberta

10:00 AM MILK BREAK

10:15 AM DOOR PRIZE

10:20 AM HACCP FOR FOOD SERVICE - John Guzewich, Bureau of Food Protection, Albany, N.Y.

10:50 AM ABILITY TO SEQUESTER TRANSFERRIN - Ion As An Indicator of Virulence in *VIBRIO VULNIFICUS* - G. N. Stelma*, A. L. Reyes, and C. H. Johnson, FDA, Cincinnati, OH

11:10 AM INFLUENCE OF GROUND BEEF STORAGE CONDITIONS ON THE BIOLUMINOMETRIC ESTIMATION OF MICROBIAL POPULATIONS - F.K. Cook*, P.R. Knox and M.D. Pierson, Virginia Polytechnic Institute, Blacksburg, VA

11:30 AM FOODBORNE VIRUSES - Mark Sobsey, University of North Carolina, Chapel Hill, NC

TUESDAY - AUGUST 6, 1985
Morning - Milk Sanitation Session - Regency IV
Roy Ginn, Chairman

8:25 AM DOOR PRIZE

8:30 AM THE CHALLENGE OF '86 -*REDUCING SOMATIC CELL COUNTS TO BELOW ONE MILLION* - William Crist, University of Kentucky, Lexington, KY

9:00 AM EFFECTS OF AN AUTOMATIC BACKFLUSH SYSTEM ON MILK IODINE LEVELS - T. Wyatt Smith* and S. B. Spencer, University of California, Davis, CA and The Pennsylvania State University, University Park, PA

9:20 AM A SURVEY OF THE INCIDENCE OF *LISTERIA MONOCYTOGENES* IN RAW MILK - J. Lovett*, D. W. Francis, J. M. Hunt and R. G. Crawford, FDA, Cincinnati, OH

9:40 AM INTERSTATE MILK SHIPPERS REPORT OF 1985 CONFERENCE - J. I. Kennedy, State Milk Board, Jefferson City, MO

10:00 AM MILK BREAK

10:15 AM DOOR PRIZE

10:20 AM NONPROTEIN NITROGEN (NPN) Factors Influencing and Implications to the Dairy Industry, V.S. Packard, University of Minnesota, St. Paul, MN

10:50 AM A RAPID FIELD TEST FOR THE DETECTION OF BETA-LACTAM - S. E. Charm, R. Leary, K. Smith*, M. Cleveland and R. Satter, Penicillin Assays, Madden, MA

11:10 AM ESTIMATION OF THE TOTAL NUMBER OF AEROBIC BACTERIA IN ICE CREAM - J. Zindulis*, T. Tsang, and S. Semuta, Bactomatic, Princeton, NJ

11:30 AM COMPUTERIZATION OF DAIRY REGULATORY RECORDS - K. C. Smith, Texas Department of Health, Austin, TX

TUESDAY - AUGUST 6, 1985
Afternoon - Food Sanitation Session - Regency I
Symposia on Irradiation in Foods
Dr. R. B. Read, Jr. and R. B. Maxcy, Co-Chairman

1:25 PM	DOOR PRIZE
1:30 PM	INTRODUCTION, Dr. R. B. Read Jr., FDA, Washington, D.C.
1:35 PM	THE PUBLIC HEALTH ASPECTS OF LOW DOSE IRRADIATION FOR MEAT AND POULTRY PRODUCTS - Ronald Engel, USDA, Washington, D.C.
2:15 PM	HIGH DOSE APPLICATION OF STERILIZATION AND THE RELATION TO CLOSTRIDIA DESTRUCTION AND POTENTIAL HAZARD
3:20 PM	MILK BREAK
3:35 PM	DOOR PRIZE
3:40 PM	FACILITIES AND THEIR CONTROL FOR COMMERCIAL IRRADIATION OF FOODS - Martin Welt, Radiation Technology, Rockaway, NJ
4:15 PM	THE REGULATORY POSITION ON IRRADIATION OF FOODS, LABELING, CONTROL AND PUBLIC HEALTH CONSIDERATIONS, - Clyde Takeguchi, FDA, Washington, DC.
4:50 PM	SUMMARY WITH EMPHASIS ON THE SIGNIFICANCE OF IRRADIATION OF FOOD IN RESPECT TO THE *IAMFES* GROUP - R. B. Maxcy, University of Nebraska, Lincoln, NE

TUESDAY - AUGUST 6, 1985
Afternoon - Milk Sanitation Session - Regency IV
Leon Townsend, Chairman

1:25 PM	DOOR PRIZE
1:30 PM	UNIFORMITY OF CONSTITUANT TESTING - H. Michael Wehr - Oregon Department of Health, Salem, OR
2:00 PM	TOXICITY OF MOLDS ISOLATED FROM MOLDY SURPLUS COMMODITY CHEESE - W. Y. J. Tsai and L. B. Bullerman*
2:20 PM	A NEW AND BETTER SERVICE - COMPUTERIZED REGULATORY RECORDS - William W. Coleman, Minnesota Department of Agriculture, St. Paul, MN
2:40 PM	THE HOW AND WHY OF DAIRY FARM INSPECTION - Sidney E. Barnard, The Pennsylvania State University, University Park, PA
3:00 PM	MILK BREAK
3:15 PM	DOOR PRIZE
3:20 PM	PANEL - SCREENING LOADS OF MILK FOR QUALITY, Franklin R. Balliet, Dairylea, Moderator; COOPERATIVE - John J. Althaus, Milk Marketing, Inc., Strongsville, OH; PROCESSOR - Ray Koeppel, Heritage Farms Dairy, Murfreesboro, TN; REGULATORY - William A. Brown, Florida Department of Agriculture and Consumer Services, Tallahassee, FL

TUESDAY - AUGUST 6, 1985
Evening - Food Sanitation Session - Regency I
Cracker Barrel
Dr. Robert B. Gravani, Moderator

7:30 PM - 8:30 PM — ***A National Test for Food Service Managers***
James L. Brown, National Restaurant Association, Washington, D.C.; C. J. Teryek, Center for Occupational and Professional Assessment, Princeton, NJ; W. Joel Simpson, Dobbs International Services, Memphis, TN; J. Carroll Sellers, FDA, Nashville, TN

TUESDAY - AUGUST 6, 1985
Evening - Milk Sanitation Session - Regency IV
Cracker Barrel
William W. Coleman, Moderator

7:30 PM - 8:30 PM — ***Raising Fluid Milk Composition Standards***
John B. Adams, National Milk Producers Association, Arlington, VA; William Tinglebaugh, Milk Industry Foundation, Washington, D.C.; Eugene T. McGarrahan, FDA, Washington, D.C.

WEDNESDAY - AUGUST 7, 1985
Morning - Food Sanitation Session - Regency I

8:25 AM	DOOR PRIZE
8:30 AM	SYMPOSIA - MICROBIOLOGICAL CRITERIA FOR FOODS. WHERE ARE WE NOW? - H. Michael Wehr and John Silliker, Co-Chairman
8:30 AM	INTRODUCTION - H. Michael Wehr, Oregon State Department of Health, Salem, OR
8:35 AM	NAS/NRC SUBCOMMITTEE ON MICROBIOLOGICAL CRITERIA FOR FOODS: HISTORY, PROCESS RECOMMENDATIONS, John Silliker, Silliker Laboratories, Carson, CA
9:10 AM	FDA PERSPECTIVE - Dr. R. B. Read, Jr, FDA, Washington, D.C.
9:35 AM	USDA PERSPECTIVE, Ralph Johnston, USDA, Washington, D.C.
10:00 AM	MILK BREAK
10:15 AM	DOOR PRIZE
10:20 AM	A STATE PERSPECTIVE - H. Michael Wehr
10:45 AM	INDUSTRY PERSPECTIVE - Donald A. Corlett Jr., Del Monte Corp., Walnut Creek, CA
11:15 AM	SUMMARY AND DISCUSSION, John Silliker

WEDNESDAY - AUGUST 7, 1985
Morning - Milk Sanitation Session - Regency IV
Archie Holliday, Chairman

8:25 AM	DOOR PRIZE
8:30 AM	MODERN MICROBIOLOGICAL PROCEDURES FOR DAIRY PRODUCTS - Sita Tatini, University of Minnesota, St. Paul, MN
9:00 AM	RATIOS OF CALCIUM AND SODIUM TO OTHER NUTRIENTS IN DAIRY PRODUCTS - B. J. Demott, University of Tennessee, Knoxville, TN
9:20 AM	INFLUENCE OF SAMPLE RECONSTITUTION ON THE RECOVERY OF *SALMONELLA* SPP. FROM LOW - MOISTURE DAIRY FOODS - Paul L. Poelma*, Clyde R. Wilson, Wallace H. Andrews, FDA, Washington, D.C.
9:40 AM	A RAPID TEST FOR THE IDENTIFICATION AND MEASUREMENT OF ALL ANTIBIOTICS IN MILK - Stanley E. Charm*, Mark Cleveland and Kirsten Smith
10:00 AM	MILK BREAK
10:15 AM	DOOR PRIZE
10:20 AM	3A STORY - Dr. Henry V. Atherton, University of Vermont, Burlington, VT
10:50 AM	PANEL - RANCID FLAVORS OF MILK - CAUSES AND PREVENTION, Sidney E. Barnard, Moderator; PLANTS - Eugene T. Wolff, FARMS - James H. Reeder and William B. Hastings

WEDNESAY - AUGUST 7, 1985
Afternoon - Food Sanitation Session - Regency I
Dr. Robert Marshall, Chairman

1:25 PM	DOOR PRIZE
1:30 PM	FOOD TAMPERING - Dr. Robert B. Gravani, Cornell University, Ithaca, NY
2:00 PM	COMPARATIVE SHELF LIFE OF THAWED FROZEN LOBSTER TAILS FROM VARIOUS SOURCES - John A. Koburger* and Mary L. Miller, University of Florida, Gainesville, FL
2:20 PM	SURVIVAL OF HEPATITIS A. VIRUS (HAV) IN CREME FILLED COOKIES - M. D. Sobsey*, D. A. Wait and K. Wermer, University of North Carolina, Chapel Hill, NC
2:40 PM	MISTAKES BY THE FOOD INDUSTRY CAN BE EXPENSIVE - Dr. Ewen C. D. Todd, Banting Research Centre, Ottawa, Canada
3:00 PM	MILK BREAK
3:15 PM	DOOR PRIZE
3:20 PM	EFFECTIVENESS OF FOOD PREMISE INSPECTION - Dr. Frank Bryan, Communicable Disease Center, FDA, Atlanta, GA
3:50 PM	FDA MODEL SALVAGE CODE - AN APPROACH TO THE PROBLEM - Irving Bell, Kentucky Department for Health Services, Frankfort, KY
4:20 PM	CONTROL OF FRICHINOSIS BY LOW - DOSE IRRADIATION OF PORK - R. J. Brake, K. D. Murrell, E. E. Ray*, J. D. Thomas, B. A. Muggenberg and

J. S. Sivinski, New Mexico State University, Las Cruces, NM

WEDNESDAY - AUGUST 7, 1985
Afternoon

1:30 PM — National Mastitis Council Board

WEDNESDAY - AUGUST 7, 1985
Afternoon - Environmental Sanitation Session - Regency IV
Helene Uhlman, Chairperson

1:25 PM — DOOR PRIZE
1:30 PM — GROUND WATER CONTAMINATION, Donald R. Rima, Tennessee Department of Health and Environment, Nashville, TN
2:00 PM — INCINERATION AND HAZARDOUS WASTE MANAGEMENT, George Vander Velde, Chemical Waste Management, Inc., Oak Brook, IL
2:30 PM — NEW TECHNIQUES IN TOXIC WASTE MANAGEMENT - Jerry Trumpey, Chemical and Environmental Conservation Systems, Cincinnati, OH
3:00 PM — MILK BREAK
3:15 PM — DOOR PRIZE
3:20 PM — ENVIRONMENTAL HEALTH DATA PROCESSING - Dudley J. Conner* and Anita Travis, Department for Health Services, Frankfort, KY
3:40 PM — THE HYDROPHOBIC PROPERTIES OF *CLOSTRIDIUM PERFRINGENS* SPORES - S. E. Craven* and L. C. Blankenship. Russell Research Center, Athens, GA
4:00 PM — PROBLEMS ASSOCIATED WITH APPLYING SEWAGE SLUDGE TO CROPLAND - Robert Bastian U.S. Environmental Protection Agency, Washington, D.C.

WEDNESDAY - AUGUST 7, 1985
Evening

6:00 PM - 7:00 PM — RECEPTION
7:00 PM - 10:00 PM — ANNUAL AWARDS BANQUET
PRESIDING - Archie C. Holliday
INVOCATION - Ivan Parkin
INTRODUCTIONS
PRESENTATION OF AWARDS - Dr. A. Richard Brazis, Awards Chairman

1. Samuel J. Crumbine Award, Sponsored by the Single Service Institute
2. Norman F. Sherman Award, Sponsored by the National Institute for the Food Service Industry
3. Certificate of Merit Awards
4. Honorary Life Membership
5. C. B. Shogren Memorial Award
6. Citation Award
7. Harold Barnum Industry Award, Sponsored by NASCO
8. Educator Award, Sponsored by Milking Machine Manufacturer's Council of the Farm and Industrial Equipment Institute
9. Sanitarian's Award, Sponsored by Klenzade Products, Division of Economics Laboratories; Wyandotte Corporation, Inc.; Monarch Chemicals, Division of H. B. Fuller

INSTALLATION OF OFFICERS
Past President's Award

THURSDAY - AUGUST 8, 1985
Morning

7:30 AM — IAMFES EXECUTIVE BOARD BREAKFAST MEETING

THURSDAY - AUGUST 8, 1985
National Mastitis Council
Summer Meeting - Regency IV

ENTERTAINMENT
REGISTRANTS AND PARTNERS

SATURDAY - AUGUST 3, 1985

5:30 PM — Grand Ole Opry*
Bus leaves hotel for 6:30 Show
8:30 PM — Grand Ole Opry*
Bus leaves hotel for 9:30 Show
*Tickets are limited to pre-registration prior to July 1 on a first come basis.

SUNDAY - AUGUST 4, 1985

6:00 PM - 8:00 PM — EARLY BIRD RECEPTION
Davidson

MONDAY - AUGUST 5, 1985

6:00 PM - 10:30 PM Tennessee Hoedown
Kick up your heels and swing your partners to the music and tickle your tastebuds with some "down home vittles" when we go to the country for an evening of Country Music, Food and Fun!

TUESDAY - AUGUST 6, 1985

5:00 PM - 7:30 PM PAST PRESIDENTS' DINNER - Suite 7B

WEDNESDAY - AUGUST 7, 1985

6:00 - 7:00 PM RECEPTION - Ballroom Foyer and Davidson B

7:00 - 10:00 PM AWARDS BANQUET
Regency Ballroom Entertainment by "Smoky Mountain Sunshine"

REGISTRATION

Saturday, August 3	1:00 PM - 5:00 PM (Pre-Registered Pick up only) Davidson A
Sunday, August 4	12 noon - 5:00 PM - Ballroom Foyer
Monday, August 5	8:00 AM - 5:00 PM - Ballroom Foyer
Tuesday, August 6	8:00 AM - 5:00 PM - Ballroom Foyer
Wednesday, August 7	8:00 AM - 5:00 PM - Ballroom Foyer
Thursday, August 8	7:00 AM - 12:00 NOON (NMC Registration) - Ballroom Foyer

PARTNER PROGRAM
MONDAY - AUGUST 5, 1985 - Davidson B

8:00 AM - 5:00 PM	Partner Hospitality
1:00 PM - 2:00 PM	Fall Fashion Show

TUESDAY - AUGUST 6, 1985 - Davidson B

8:00 AM - 5:00 PM	Partner Hospitality
9:30 AM - 1:30 PM	Tour of Music Row, also including tours of a recording studio, downtown attractions, and country music stars' homes
3:00 PM - 4:00 PM	Southern Cooking School, featuring recipes from Miss Bobo's kitchen

WEDNESDAY - AUGUST 7, 1985 - Davidson B

8:00 AM - 5:00 PM	Partner Hospitality
8:30 AM - 9:30 AM	Cosmetic Makeover Clinic featuring Ralph Lauren products
10:00 AM - 3:00 PM	Shopping trip - Bandywood Shopping Mall

New Members

Peter John Slade
Midwest Res Inst
Tabuk, Saudi Arabia

Mark Linda
Black Hawk Cty Health Dept.
Waterloo, IA

Don Galarneau
Verona Lab, Inc.
Verona, NY

Marlene A. Bulgarelli
Univ of Georgia
Athens, GA

Lynn S. Hinckley
Univ of Connecticut
Storrs, CT

R. J. McDougall
Qual Meat Packers Ltd.
Toronto, Ont, CN

Guy Bonin
AGROPUR
St. Laurent, Que, CN

John P. Haag
WDATCP
Stanley, WI

Jack Michelson
Michelson Lab, Inc.
Los Angeles, CA

Torbjorn Lothman
Modern Maid Food Prod
Jamaica, NY

John W. Jackson
Alpha Beta Co.
Fontana, CA

Bill Pickard
Natl Sea Prod Ltd.
Lunenburg, N.S., CN

Donald Grim
Marriott Corp.
Washington, DC

Robert Held
Yoplait USA
Reed City, MI

Randall M. Durant
Jefferson Cty Hlth Dept.
Port Townsend, WA

Doug Heyvaert
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Bloomington, MN

M. Frederick Mitchell
Minnesota Dept of Hlth
Minneapolis, MN

Shirley Storandt
Univ of WI Hlth Serv
Madison, WI

June Degraft-Hanson
Univ of Maryland
Hyattsville, MD

Fred Keeslar
Lenawee Cty Hlth Dept.
Adrian, MI

Jack Hoey
Food Prot Inst
Atlanta, GA

Betty Brink
Fargo, ND

Zdenek Matyas
Univ of Vet Sci
Brno, CZECH

William A. Laird
Pittsburg, PA

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1985
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( ) Complete set 3-A Dairy & Egg Stds ..... ea $45.+$3 postage
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Food Science Facts
For The Sanitarian

Dr. Robert B. Gravani
Cornell University
Ithaca, NY

FOOD DETERIORATION AND SPOILAGE BY RODENTS

Rodents have plagued mankind since prehistoric times and still continue to be a major problem to the food industry today. A continuing battle to eliminate or reduce the rodent population has been ongoing for centuries. These beasts have become very clever enemies of man because of their keen senses of smell, touch and hearing and their ability to adapt to a wide range of living conditions.

Although there are many kinds of rodents, (including squirrels, woodchucks, muskrats, porcupines and beavers) the rodents that are most troublesome in the food industry are Norway rats, roof rats and house mice. These rodents have been responsible for more human illness, deaths and destruction of food than any group of mammals. They can carry about 35 diseases of humans and livestock.

There are about 200 million rats in the United States today; almost one for every person! Each rat eats about 25 pounds of food a year. These rodents also damage and contaminate greater amounts of food and materials through gnawing, chewing, body contact and by the discharge of their body wastes.

Food industry employees need to be familiar with rodents and their habits in order to understand ways to control these troublesome animals.

RODENT TYPES

The Norway rat and house mouse are found throughout New York State and the United States, while the roof rat is found primarily in the south, along the pacific coast and in Hawaii. Since the roof rat is not prevalent in New York, it will not be included in our discussion.

Norway Rat

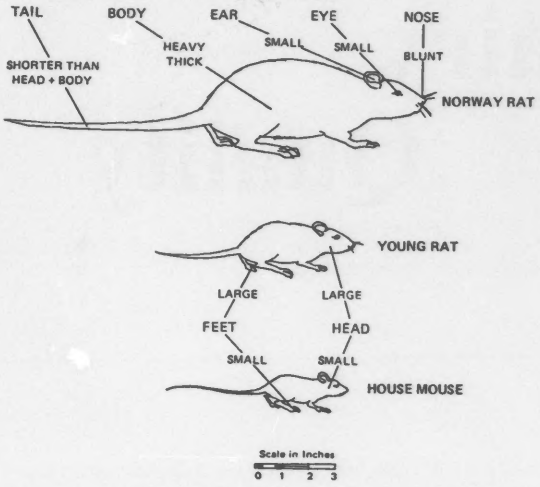
The Norway rat is also called the barn rat, brown rat, gray rat, sewer rat, water rat, wharf rat and the house rat. It is a burrowing rat and harbors in burrows in the ground. These burrows are about 3" in diameter and are around dumps, sewers, buildings, and under rubbish close to food and water. The Norway rat will eat almost any food, but prefers garbage, meat, fish, cereal, nuts, fruits, vegetables, and pastry. These rodents usually move within a limited area to find food, water, shelter and a mate. This distance is called the "home range" and is a radius of about 100-150 feet for the Norway rat.

House Mouse

The house mouse is the smallest of the rodents and is widely distributed throughout the United States. The house mouse is usually found in and around buildings, nesting in walls, cabinets, furniture and stored food products. It eats a variety of foods including cereals, grains, nuts, seeds, lard, butter, meat, bacon, insects, pastry and candy. This highly inquisitive rodent has a very narrow home range radius of about 10 to 30 feet.

RODENT IDENTIFICATION

Rodents involved in an infestation must be properly identified before an effective control program is undertaken. Materials, equipment and methods to control one type of rodent may not be effective against another. The diagram below provides a simple way to distinguish between a Norway rat, a young rat and a house mouse. Note that the features of these rodents are quite different.



Young rats can be distinguished from mice by their difference in body build. Young rats have larger hind feet and their tails are much thicker than the tails of house mice. The heads of young rats are much larger and their fur is much fuzzier when compared to mice. In general, the house mouse is much smaller and has finer fur than the rat.

The table below gives some additional characteristics and measurements of adult rodents.

	Norway Rat	*House Mouse*
Fur Color	Reddish Brown	Dusky Gray
Weight	10 - 17 oz.	1/2 - 3/4 oz.
Total Length	12 3/4 - 18 in.	6 - 7 1/2 in.
(Nose to tip of tail)	Nose blunt; heavy thick	Nose pointed; small
Head and Body	body; 7 - 10 in.	body; 2 1/2 - 3 1/2 in.
Tail	Shorter than head plus body; 6 - 8 1/2 in.	Equal to or a little longer than head plus body; 3 - 4 in.
Ears	Small, close set, appear half buried in fur; rarely over 3/4 in.	Prominent, large for size of animal; 1/2 in. or less.
Hind Feet (Heel to tip of longest toe)	Usually over 1 - 1 1/2 in.	Generally less than 3/4 in.

REPRODUCTION

It has been estimated that a pair of rats could have 15,000 descendents in their life span of one year! Information on the reproduction of rodents is given in the table below.

	Norway Rat	*House Mouse*
Reach Sexual Maturity	3 months	1 1/2 - 2 months
Gestation Period	22 days	19 days
No. of Young/ Litter	6 - 12	5 - 6
No. of Litters/ Year	4 - 7	6 - 10
Life Span	1 Year	1 Year

Rats and mice are major pests because of their ability to reproduce quickly. The size of rodent populations is effected by their living conditions. An adequate supply of good quality food, shelter with few disturbances and no predators often results in an increased rodent population. The next Food Science Facts will continue the discussion on rodents and will highlight measures to control them.

Dairy Quality

by **Darrell Bigalke,** *Food & Dairy Quality Mgmt., Inc., St. Paul, MN*

COST OF IMPROVED PRODUCT QUALITY

In recent years dairy associations, scientific and trade organizations, academia, and other interested dairy groups have given much attention to the need for production of quality dairy products. Most of this attention has been directed toward the benefits that the dairy industry would receive. However, little has been written on what economic benefits the individual dairy company could derive from improved product quality.

While technology for improving dairy product quality is available, little has been appplied successfully. Many dairy operations have not taken advantage of the available technology and have a need for improved product quality and consumer acceptance. There is no doubt that there exists several reasons why the available technology has not been used. Lack of effective quality management is one of the leading reasons. The absence of apparent increased profits from improved quality may be one of the reasons quality improvement programs may not receive the necessary attention. In fact, many dairy and/or quality control managers argue that "the cost of quality" outweigh its benefits. This attitude stems from thoughts that quality is not profit. However, if properly managed, quality control can be a source of profits. To effectively manage a quality improvement program, a quality control manager must demonstrate that quality can result in reduced costs and improved profits.

Crosby (1), in his book, *Quality is Free*, suggests that most American companies are spending 15 to 20% of sales on "rework, scrapping, repeated service, inspection, tests, warrantees, and other quality-related costs." While most dairy personnel can visualize the need for customer satisfaction, other benefits can result from production of quality products. Reduced distribution costs, reduced customer relations service costs, increased yields, more effective sales efforts, reduced customer relations service costs, increased yields, more effective sales efforts, reduced recall costs, reduced rework costs, and other benefits can result in decreased operating costs. As Crosby points out, when demonstrating that quality can be a means of profit, one must dispel several misbeliefs. First, most dairy people consider the relationship between quality and profits only when poor quality results in a profit deteriorating situation. Second, most dairy people consider quality as "merely goodness" that costs more. Third, because most dairy people consider quality as "something intangible" and therefore not measurable, little consideration is given to establishing a method of determining the profits that a quality improvement program can generate.

One method to express the cost of quality is to express it in terms of percentage of sales. Three parameters normally establish the cost of quality (prevention costs, appraisal costs, and failure costs). *Prevention costs* include quality audits, program planning, operational training, specification review, and engineering review. *Appraisal costs* include laboratory costs, receiving inspection and testing costs, supplier audits, packaging inspections, status reporting, and other appraisal costs. *Failure costs* include product recall costs, product liability costs, scrap or product failure, product loss, reduced yields, and consumer affairs.

To illustrate how determining the cost of quality can be an effective tool for managing a quality improvement program, consider the following example: in 1979 Dairy A had prevention costs of 1.5% of sales, appraisal costs of 1.5% of sales, and failure costs of 15% of sales, a total of 18% of sales for the cost of quality. In 1981, after implementation of a quality improvement program, Dairy A had prevention costs of 3% of sales, appraisal costs of 3% of sales, and failure costs of 2% of sales. Dairy A, in 1979, had $100,000,000 in sales. The cost of quality for 1979 was $18,000,000. In 1981, Dairy A had a cost of quality of 8% of sales and sales of $120,000,000, or a cost of quality of $9.6,000,000. The end result of the quality improvement program is profits of $8,400,000 (not including the profits from the increase in sales).

The intent of the above example is to show that quality can be measured in terms of profits. Successful management of a quality control program requires planning. Planning requires setting objectives. These objectives must be measurable, therefore determining the profits from a quality control program and an effective means of accomplishing this task.

The objective of this newsletter is not to discuss what are appropriate prevention, appraisal, or failure costs, but to demonstrate that quality can be measured in terms of profits.

N.M.C.
NATIONAL MASTITIS COUNCIL

Mastitis Needs Program Approach in Large Herds

"It can be viewed as a disease of mismanagement," said Tom Fuhrmann, a Chandler, Arizona, veterinarian who specializes in mastitis control and who recently joined the management team of United Dairymen of Arizona, a dairy cooperative headquartered in Tempe.

Speaking at the annual meeting of the National Mastitis Council, Fuhrmann said that if a low incidence of mastitis is a management objective, then the daily activities of personnel must be scheduled to be consistent with the principles of mastitis control. All help on the dairy must understand that mastitis occurs when bacteria and other microorganisms from the environment get into the udder and destroy milk-forming tissue. That invasion and destruction of udder tissue results in abnormal milk and lower production.

However, all organisms must penetrate the teat end before mastitis occurs. Failure to do all that is possible and practical to prevent teat end penetration by bacteria results in a higher incidence of mastitis than is possible with a sound program.

Therefore, a prevention program must identify the times of high risk microorganism contamination of the teat end and outline the steps necessary to reduce or eliminate that contamination.

The components of a mastitis control program need to include:

1. Methods to estimate the current status of mastitis within the herd,
2. A milking procedure which emphasizes hygiene, as well as efficient milk removal,
3. Routine milking system maintenance,
4. Proper lactating and dry cow treatment and handling procedures,
5. Consideration of cow segregation and culling of those animals which do not respond to treatment.

Principles of people management emphasizes the need to establish goals for those who play integral roles in any program. Therefore, in developing a mastitis control scheme, goals must be set, performance monitored and people motivated constantly. Additional columns, prepared as service to the industry, will cover these points in more detail.

Information for this item on mastitis is taken from the proceedings of the 1985 annual meeting of the National Mastitis Council. For information contact the NMC office at 1840 Wilson Blvd., Arlington, VA 22201.

Quality Control in Foodservice. Marvin E. Thorner and Peter B. Manning. Revised Edition. AVI Publishing Company. Westport, Conneticut. 1983. 366 pages.

"Quality control, or quality assurance, is an activity, procedure, method, or program that will ensure the maintenance and continuity of specifications and standards of a product within prescribed tolerances during all stages of handling, processing, preparation, and packaging, and will further ensure that all the original and desirable characteristics are sustained during storage, processing, or preparation and will remain unaltered until consumed."

"The terms *quality control* and *quality assurance* are used interchangeably. The latter term is the more recent, and is gaining acceptance; however, both have the same meaning."

Thorner and Manning begin Chapter One with the above quotes. However, more simply put, Quality is conformance to a standard established by the manufacturer or by the customer. Also, the authors discuss the meaning of quality as viewed by consumer's, technicians and management. Quality must be viewed and perceived equally by all three groups.

These are some basic differences between quality assurance and quality control. Quality Assurance can be defined as a planned and systematic management tool to produce and market foods which are uniform, safe, nutritious, flavorful, economical, and provide the confidence that the product will conform to established requirements. Quality Control is the day-to-day implementation and execution of the quality assurance program. Thorner and Manning entitle this book correctly. This book is a comprehensive discussion of quality control for the foodservice industry. This book is written as an on-the-job training manual and/or guide for all categories of foodservice personnel.

The revised version of the book includes sixteen chapters. The topics of the chapters in the book include: Scope of Quality Control in Foodservice; Implementation of a Quality Control Program; Purchasing and Specifications; Receiving, Sampling, and Product Inspection Control; Storage and Issuing Control; Preparation and Production Equipment; Precooking Quality Control; Cooking Quality Control; Post Cooking Quality Control; Desserts and Baked Products Control; Non-alcoholic Beverages Control; Food Spoilage and Sanitation Control; Water Quality and Warewashing Control; Quality Control of Vending Machines; Energy Management; and Preventive and Corrective Maintenance.

The authors state that the Energy Management and the Food Spoilage chapters have been revised and updated. Also, they have added the final chapter on preventive maintenance in assuring food quality as well as in reducing energy consumption.

Thorner and Manning clearly state on the preface that the examples presented in their book serve as guidelines for tracing poor quality food or faulty preparation and production techniques. The most important chapters in the book are Chapters 7, 8, and 9 (Precooking, Cooking, and Postcooking Quality Control, respectively). The book is filled with practical examples. Coffee is used in many examples throughout the book. Sensory evaluation is discussed in length as an effective quality control tool.

This book shows simple inspection skills that may be used without prior technical training and which can serve as an effective guide and instrument to check quality parameters at all stages of a foodservice operation. The book includes a comprehensive glossary and appendix. Thorne and Manning have provided a needed book for foodservice operators, foodservice inspectors and professors involved in foodservice education. With the increase in eating away from the home, this book is of interest to foodservice operators and consumers.

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Abstracts of papers in the May Journal of Food Protection

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Effect of Four Presumptive Coliform Test Media, Incubation Time and Product Inoculum Size on Recovery of Coliforms from Dairy Products, B. C. Cooke, M. A. Jorgensen and A. B. MacDonald, Dairy Division, Ministry of Agriculture and Fisheries, Wallaceville, New Zealand

J. Food Prot. 48:388-392

The need to consider the interrelationship of relevant procedural parameters in media comparison studies has been shown. In this study, the influence of media-type on recovery of coliforms from dairy products was found to be of less importance than the effects of incubation time and inoculum size. Statistically significant media-type effects were found, however, and these contrasted with the observations of other workers in that bile-salt-based media performed better than chemically-defined media. These findings indicate that media studies too specifically designed may yield conclusions with limited range of application.

Fluorescence of Fish Bones, H. H. Huss, P. Sigsgaard and S. A. Jensen, Technological Laboratory, Ministry of Fisheries, Building 221, The Technical University of Denmark, DK-2800 Lyngby, Denmark; Carlsberg Research Laboratory, Department of Brewing Chemistry, Gamle Carlsberg Vej 10, DK-2500 Valby, Denmark; and Carlsberg Research Laboratory, Department of Biotechnology, Gamle Carlsberg Vej 10, DK-2500 Valby, Denmark

J. Food Prot. 48:393-396

A fluorescence method is described for the qualification and quantification of bones and bone fragments in fish fillets. Bones from six different fish species were shown to exhibit a strong ultraviolet-blue fluorescence (390 nm), when excited by light at 340 nm. The method greatly simplifies searching for bones in fish fillets when they are not deeply embedded in tissue. It is concluded that the method offers promise in the establishment of a routine analysis for inspection of individual fillets in a normal filleting line for bones and parasitic nematodes.

Iodine in Cow's Milk Produced in the USA in 1980-1981, John C. Bruhn and Antoine A. Franke, Cooperative Extension and Department of Food Science and Technology, University of California, Davis, California 95616

J. Food Prot. 48:397-399

In 378 samples of milk collected from farms and silos outside California, iodine varied from 30 to 3484 μg/kg and averaged 499 μg/kg. In a previously reported study, iodine in 1021 samples of milk collected from farms in California varied from 22 to 4048 μg/kg and averaged 328 μg/kg. Of samples collected outside California, 68.0% were below 500 μg/kg; of samples collected in California 83.4% were below. Volume weighted averages were calculated for both sets of samples. The volume weighted average outside California was 438 μg/kg and inside California was 316 μg/kg. While some farms do produce milk containing high (more than 500 μg/kg) concentrations of iodine, dilution of that milk with milk lower in iodine results in finished fluid and manufactured products low in iodine; thus it is unlikely that any population group purchasing processed dairy foods at the retail level in the USA will be exposed to excessive concentrations of iodine in the dairy products they consume. However, it is possible that some farm families using only the milk produced on their farms might be at risk.

Microanalytical Quality of Macaroni and Noodles, John S. Gecan and John C. Atkinson, Division of Microbiology and Division of Mathematics, Food and Drug Administration, Washington, D.C. 20204

J. Food Prot. 48:400-402

A survey was conducted to determine the sanitary quality of macaroni and noodle products. The official method of the Association of Official Analytical Chemists was used to recover light filth such as insect fragments, whole or equivalent insects and rodent hair fragments from 225-g samples of macaroni and noodles (764 units of macaroni and 725 units of egg noodles). Insect fragments, the most frequently encountered defect, were found in 66% of the macaroni product samples and 83% of the egg noodle samples. Insect fragment counts ranged from 0 to 317 with a mean of 4.3 for macaroni products and 0 to 343 with a mean of 6.8 for egg noodles. Ranges of other defect counts in macaroni products were 0 to 5 for rodent hair fragments and 0 to 9 for whole or equivalent insects. Ranges of other defects in egg noodles were 0 to 12 for rodent hair fragments and 0 to 17 for whole or equivalent insects.

Microbiological Profiles and Storage Temperatures of Egyptian Fish and Other Sea Foods, M. Fahmi Saddik, M. R. El-Sherbeeny, Brince M. Mousa, Ahmed El-Akkad and Frank L. Bryan, Nutrition Institute, Ministry of Health, Cairo, Egypt and Centers for Disease Control, Atlanta, Georgia 30333

J. Food Prot. 48:403-406

Raw and cooked fish and other sea foods (108 samples) were collected from hotels of different classes, restaurants, markets, street vendors, and small cook-shops and analyzed for common foodborne pathogens. Salmonellae were isolated from two samples of raw shrimp, but not from raw fish and other seafoods. *Shigella* was isolated from one sample of raw fish and from two samples of raw shrimp. *Vibrio parahaemolyticus* was isolated from three raw fish samples and one raw shrimp sample. Forty-eight percent of samples of raw fish, 30% of samples of raw shrimp, and a sample of raw mussels and a sample of crab contained *Staphylococcus aureus*. Cooked products were free from salmonellae, shigellae and *V. parahaemolyticus*, but approximately 1/3 of these contained *S. aureus*, which suggests contamination after cooking. Aerobic colony count (30°C) of cooked fish and shellfish dishes was more than a million organisms/g. Such large numbers of microorganisms on cooked products suggests either a prolonged holding time or gross contamination after cooking.

Preservation of High-Moisture Corn by Microbial Fermentation, Rolando A. Flores-Galarza, Bonita A. Glatz, Carl J. Bern and Larry D. Van Fossen, Department of Agricultural Engineering and Department of Food Technology, Iowa State University, Ames, Iowa 50011

J. Food Prot. 48:407-411

High-moisture corn samples (27% moisture) were inoculated with *Lactobacillus plantarum* and/or *Propionibacterium shermanii* and stored in sealed containers or under carbon dioxide atmosphere for 60 d at 26°C. Growth of the inoculated organisms was observed in the corn, and the final pH of inoculated samples was significantly lower than the final pH of uninoculated samples. Mold growth was prevented in all samples, and the initial yeast population was drastically reduced in those samples inoculated with *P. shermanii*. Inoculation with *L. plantarum* accelerated acid production in the early stages of the fermentation. Flushing with carbon dioxide did not alter the fermentation but resulted in a slightly lower final moisture content.

Influence of Hot-Boning, Cooking and Method of Reheating on Product Attributes of Lamb Roast, Earl E. Ray, B. W. Berry and J. D. Thomas, Department of Animal and Range Sciences, New Mexico State University, Las Cruces, New Mexico 88003 and Meat Science Research Laboratory, SEA-ARS, U.S. Department of Agriculture, Beltsville, Maryland 20705

J. Food Prot. 48:412-415

Ten lamb carcasses were used to evaluate the effects of hot-boning (HB), cooking, freezing and method of reheating upon cooking and palatability attributes of lamb roast. After slaughtering, the leg and loin were removed (30 min post-exsanguination) from the right side and cooked immediately (HB), while the left side was fabricated 5 d later (cold boned, CB) and cooked until the internal temperature reached 68°C. The roasts were frozen and stored for about 45 d. Roasts were thawed (2°C), and pre-cooked roasts were divided into similar portions and assigned to three reheating methods: (*a*) conventional electric oven (*b*) microwave oven and (*c*) a combination method where the first half of the cooking time was by conventional roasting and the second half by microwave oven. Results indicate HB roasts had higher ($P<.05$) cooking losses, thaw losses and reheating losses (3%) than CB roasts. HB leg roasts required less ($P<.05$) time to cook than CB, but no difference ($P>.05$) was found for the loin roasts. Conventional oven reheating resulted in higher thaw and reheating losses, and a longer reheating time than microwave reheating or the combination method. The shear values for HB muscles of the leg were lower, in most instances, than those for CB muscles of the leg. Panel tenderness scores indicated that pre-cooked, conventional reheated HB, semimembranosus (SM) and CB, SM, were more tender than the SM reheated with a microwave oven. All the precooked, reheated products were of acceptable palatability.

Density Segregation of Corn and Wheat Naturally Contaminated with Aflatoxin, Deoxynivalenol and Zearalenone, William E. Huff and Winston M. Hagler, Jr., U.S. Department of Agriculture, Agricultural Research Service, Poultry Research Laboratory, Georgetown, Delaware 19947 and Department of Poultry Science, North Carolina State University, Raleigh, North Carolina 27650

J. Food Prot. 48:416-420

Density segregation was used to reduce mycotoxin levels of corn samples naturally contaminated with aflatoxin or deoxynivalenol, and wheat samples naturally contaminated with deoxynivalenol or zearalenone. Corn kernels which were buoyant in saturated sodium chloride represented 3% of the total sample, yet contained 74% of the aflatoxin. Corn buoyant in water contained 51 and 14% of the total deoxynivalenol present in two naturally contaminated corn samples. Subsequent segregation of corn non-buoyant in water with 30% sucrose removed additional deoxynivalenol-contaminated kernels, resulting in the combined removal of 59 and 79% of the deoxynivalenol. Removal of deoxynivalenol-contaminated corn kernels with both water and 30% sucrose reduced the concentration of deoxynivalenol by 53 and 77%. Removing wheat buoyant in water and 30% sucrose decreased the deoxynivalenol present by 96 and 68%, and reduced the deoxynivalenol concentration by 96 and 67%. Removing wheat naturally contaminated with zearalenone buoyant in water and 30% sucrose combined resulted in no detectable zearalenone remaining in the non-buoyant fraction of the samples.

Inhibitory Effects of Various Salts and/or Ionic Strengths on Growth from *Clostridium botulinum* 52A Spores or Vegetative Cells, M. K. Wagner and F. F. Busta, Department of Food Science and Nutrition, University of Minnesota, 1334 Eckles Avenue, St. Paul, Minnesota 55108

J. Food Prot. 48:421-428

Growth response from spores and vegetative cells of *Clostridium botulinum* strain 52A in peptone-yeast extract-glucose (PYEG) broth at two pH levels (5.55 or 5.85) containing sodium acid pyrophosphate (SAPP) (0, 0.2, 0.4%), NaCl (0, 1.25, 2.50%) and/or potassium sorbate (KS) (0, 0.13, 0.26%) was measured as the mean A_{630} nm of 20 tubes at 37°C. Additional treatments contained KCl and $MgCl_2$ (0, 1.25, 2.50%) without SAPP or KS. Growth ratios (GR = treatment/control) based on time to reach $A_{630} = 0.35$ were calculated to compare effects of additives on strain 52A. Growth from spores was affected significantly ($p \leq 0.01$) by pH level. KS and KS/pH interactions were also significant factors in growth from both spores and vegetative cells; SAPP/pH interactions were significant for cell growth, only. Combinations of SAPP (0.2, 0.4%) NaCl (0%) and KS (0.26%) were the most favorable treatments for delaying growth from spores or vegetative cells. NaCl (1.25, 2.50%) decreased antibotulinal effects produced by combinations of SAPP and KS. Elimination of NaCl enhanced antibotulinal effects. Formulations containing KCl or $MgCl_2$ (without SAPP and KS) at the same molarity as the NaCl in earlier treatments (0.21, 0.43) resulted in inhibition of growth from vegetative cells greater than growth from spores in the presence of $MgCl_2$ at M = 0.43 (ionic strength = 1.29). This inhibition was more evident at pH 5.55 than pH 5.85. This study in a model system suggests ionic strength and/or chloride salt may be important considerations when manipulating formulations of additives designed to control *C. botulinum* growth.

Post-Processing Temperature Rise in Foods: Conventional Hot Air and Microwave Ovens, Carol A. Sawyer, Department of Food Science and Human Nutrition, Michigan State University, East Lansing, Michigan 48824

J. Food Prot. 48:429-434

Measurement of temperature rise (N = 5 replications) in water (1000 ml), chicken frankfurters (46 ± 2 g/frankfurter) and cake cones (40 g/cone) after conventional hot air (160°C) and after microwave (2450 MHz; 50% and 100% power of 645 ± 25 W) processing indicated that temperature rise occurred more often in products heat-processed in microwave than in hot air ovens. Duration and extent of post-processing temperature rise (PPTR) in beef loaf patties (150 g/patty), pork and turkey roasts (approximately 2.3 kg/roast) and turkey casserole (0.9 kg/casserole) prepared in microwave ovens was quantified during three replications. Although present, PPTR should not change temperature objectives for domestic microwave processing of foods because of the extensive variability of duration and extent in PPTR within and among experimental products tested. However, PPTR should be given consideration when commercial products to be processed in microwave ovens and those used in mathematical modeling of microwave cooking/heating procedures are designed.

Evaluation of the Bacteriological Safety of Low-Salt Miso, Nobumasa Tanaka, Susan K. Kovats, Jean A. Guggisberg, Louise M. Meske and Michael P. Doyle, The Food Research Institute, University of Wisconsin-Madison, 1925 Willow Drive, Madison, Wisconsin 53706

J. Food Prot. 48:435-437

Studies were done to evaluate the safety of three different low-salt (2.36 to 5.79% NaCl) misos inoculated with different bacterial pathogens. *Clostridium botulinum* types A and B (inoculum level of ca. 120 spores/g) did not produce toxin in any of the misos within 18 wk at 25°C. *Staphylococcus aureus, Salmonella typhimurium* and *Yersinia enterocolitica* (inoculum level of ca. 10^3 to 10^4 CFU/g) progessively died in all of the misos held at either 10 or 25°C. The miso samples, which were obtained from Japan (3.75 and 5.79% NaCl) and California (2.36% NaCl), had water activities of 0.843, 0.835 and 0.875, respectively, and pH values of 5.26, 5.30 and 4.73, respectively. Results indicate that low-salt misos with these properties are not likely to be bacteriological health risks.

Evaluation of the Microbiological Safety of Tempeh Made from Unacidified Soybeans, Nobumasa Tanaka, Susan K. Kovats, Jean A. Gubbisberg, Louise M. Meske, Michael P. Doyle, The Food Research Institute, University of Wisconsin-Madison, 1925 Willow Drive, Madison, Wisconsin 53706

J. Food Prot. 48:438-441

Studies were done to evaluate the safety of tempeh made from unacidifed soybeans and inoculated with different bacterial pathogens. Pathogens were added to either the soybeans before fermentation by *Rhizopus oligosporus* or the tempeh after fermentation and steaming. In the latter method, the inoculated products were incubated at several different temperatures (5, 10, 15 and 25°C). *Clostridium botulinum* (types A and/or B) toxin was produced in 2 d during the fermentation and within 5 d at 25°C or 4 wk at 15°C in tempeh inoculated and incubated in vacuum packages after fermentation and steaming. *Staphylococcus aureus* grew very well (>6-$\log_{10}$ CFU/g increase) in 2 d during the fermentation, and grew from ca. 10^3 CFU/g to 10^8 CFU/g in 7 d at 25°C and 21 d at 15°C in tempeh inoculated after fermentation and steaming. Staphylococcal enterotoxins were detected in some of these samples. *Salmonella typhimurium* also grew well during the fermentation (>6-$\log_{10}$ CFU/g increase in 1 d), but grew relatively slowly at 25 and 15°C in tempeh inoculated after fermentation and steaming. *Yersinia enterocolitica* grew very well (>6-$\log_{10}$ CFU/g increase) in 1 d during the fermentation, and also grew well in tempeh inoculated after fermentation and steaming, with a >6 $\log_{10}$ CFU/g increase in 2 d at 25 or 15°C and 5 d at 10°C. Results of these studies indicate the need for maintaining: (a) a high level of sanitary practices during production and (b) good refrigeration (≤5°C) of the product following fermentation until it is used.

Polychlorinated Biphenyls in Food: A Review, Brij L. Sawhney and Lester Hankin, The Connecticut Agricultural Experiment Station, Box 1106, New Haven, Connecticut 06504

J. Food Prot. 48:442-448

Literature published from 1970 through mid-1984 on polychlorinated biphenyl (PCB) contamination of foods, including fish, dairy products, packaged and processed food and human milk, is reviewed. Sources of the contamination are discussed. The reports show that although PCBs are no longer manufactured in this country, large quantities have entered the environment. High concentrations in sediments of some streams and lakes are a continuing source of PCB entry into the food chain via the fish caught in these waters. Accidental leakage and spills from electrical transformers containing PCBs, which are in use, can also be a source of contamination. Other sources of PCB contamination such as silo sealants and packaging materials manufactured from carbonless paper containing PCBs have been essentially eliminated.

***Plesiomonas shigelloides:* An Opportunistic Food and Waterborne Pathogen,** Mary L. Miller and John A. Koburger, Food Science and Human Nutrition, University of Florida, Gainesville, Florida 32611

J. Food Prot. 48:449-457

Plesiomonas shigelloides is an oxidase-positive, gram-negative rod that has been implicated as an agent of human gastroenteritis for almost 40 years. Reports of gastroenteritis associated with *Plesiomonas* have been increasing in recent years, although inadequacies in isolation techniques and recognition procedures have undoubtedly resulted in the underreporting of this organism in the past. Existing information indicates that *P. shigelloides,* while mainly an aquatic species, is widely distributed in the environment. Recent outbreaks of gastroenteritis associated with consumption of oysters contaminated with *P. shigelloides* have resulted in an increased awareness of this organism by public health officials.

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108	128	148	168	188	208	228	248	268	288	308	328	348
109	129	149	169	189	209	229	249	269	289	309	329	349
110	130	150	170	190	210	230	250	270	290	310	330	350
111	131	151	171	191	211	231	251	271	291	311	331	351
112	132	152	172	192	212	232	252	272	292	312	332	352
113	133	153	173	193	213	233	253	273	293	313	333	353
114	134	154	174	194	214	234	254	274	294	314	334	354
115	135	155	175	195	215	235	255	275	295	315	335	355
116	136	156	176	196	216	236	256	276	296	316	336	356
117	137	157	177	197	217	237	257	277	297	317	337	357
118	138	158	178	198	218	238	258	278	298	318	338	358
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Calendar

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May 13-16, ASEPTIC PROCESSING AND PACKAGING WORKSHOP, to be held at Purdue University, West Lafayette, IN. For more information contact: James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907. 317-494-8279.

May 13-17, NATIONAL CONFERENCE ON INTERSTATE MILK SHIPMENTS, to be held at the Hyatt Regency, Lexington, KY. For more information contact: H. H. Vaux, Indiana State Board of Health, Indianapolis, IN 46206. 317-633-0313.

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 or June 4-6, 1985, FOOD ANALYSIS WORKSHOP, Salt/Sodium: Rapid Methods Evaluation. To be held at Iowa State University, Ames, Ia. For more information contact: Tom Aspelund, Iowa State University, 515-294-3156 or Carole Seifert, Office of Continuing Education, 102 Scheman Continuing Education Building, Iowa State University, Ames, Ia, 515-294-1400.

May 21-23, INTERNATIONAL DAIRY FEDERATION SEMINAR, Progress in the Control of Bovine Mastitis, to be held at Bundesanstalt fur Milchforschung, D-2300 Kiel, FRG. For more information contact: Prof. Dr. W. Heeschen, Bundesanstalt fur Milchforschung, Institut fur Hygiene, Hermann-Weigmann-Strabe 1, P.O. Box 1649, D-2300 Kiel / FRG. Telephone: (0431) 609-392 or 609-1. Telex: 292966.

May 21-23, DESCRIPTIVE ANALYSIS WORKSHOP, to be held in London, England. For more information contact: Tragon Corporation, 365 Convention Way, Redwood City, CA 94063. 415-365-1833.

May 24, DFISA INTERNATIONAL TRADE SEMINAR, to be held at the Key Bridge Marriott, Washington, D.C. For more information contact: Bruce L. D'Agostino, Director, Public Relations, Dairy and Food Industries Supply Assoc., Inc., 6245 Executive Boulevard, Rockville, MD 20852-3938. 301-984-1444, Telex: 908706.

June 3-5, NATIONAL COUNCIL FOR INTERNATIONAL HEALTH 1985 ANNUAL INTERNATIONAL HEALTH CONFERENCE, to be held in Washington, D.C. For more information contact: Dr. Curtiss Swezy, Program Manager, National Council for International Health, 2100 Pennsylvania Avenue, N.W., Suite 740, Washington, D.C. 20037.

June 3-14, IN-STORE BAKERY TRAINING PROGRAM, to be held in Manhattan, KS. For more information contact: Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

June 7-8, IFT BASIC SYMPOSIUM: FOODBORNE MICROORGANISMS AND THEIR TOXINS - DEVELOPING METHODOLOGY, to be held in conjunction with the IFT National Meeting in Atlanta, GA. For more information contact: Dr. Norman Stern, USDA-ARS, Beltsville Agricultural Research Center, Beltsville, MD 20705. 301-344-2438. Or contact: Dr. Merle Pierson, Dept. of Food Science & Technology, VPI & SU, Blacksburg, VA 24061. 703-961-6423.

June 8, WORKSHOP ON NEW FOOD INGREDIENT TECHNOLOGY, to be held at the Hilton Towers Hotel, Atlanta. For more information contact: NFBA, 1010 Massachusetts Ave., N.W., Washington, D.C. 20001. 202-789-2844.

June 17-20, BASIC FOOD PLANT MICROBIOLOGY, to be held in Manhattan, KS. For more information contact: Shirley Grunder, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

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.

July 13-20, RAPID METHODS AND AUTOMATION IN MICROBIOLOGY WORKSHOP, to be held at Kansas State University, Manhattan, KS. For more information contact: Jan Hurley, Conference Coordinator, 800-255-2757 (outside Kansas) or 913-532-5575 (in Kansas or outside the U.S.).

July 14-17, SECOND INTERNATIONAL CONFERENCE ON FOULING AND CLEANING IN FOOD PROCESSING (ICFCFP), to be held in Madison, WI. For more information contact: Daryl Lund, University of Wisconsin-Madison, Department of Food Science, 1605 Linden Drive, Madison, WI 53706. 608-262-3046.

July 15-17, TECHNIQUES IN MEASUREMENT WORKSHOP, to be held in Palo Alto, CA. For more information contact: Tragon Corporation, 365 Convention Way, Redwood City, CA 94063. 415-365-1833.

July 22-26, PRINCIPLES OF BAKERY PRODUCTION, to be held in Manhattan, KS. For more information contact: Mrs. Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

August 3-9, 1985 ANNUAL MEETING OF THE SOCIETY FOR INDUSTRIAL MICROBIOLOGY, to be held at the Westin Hotel, in Copley Place, Boston, MA. For more information contact: Mrs. Ann Kulback - SIM Business Secretary, SIM Headquarters, 1401 Wilson Boulevard, Arlington, VA 22209.

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 5-9, "BIOTECHNOLOGY: MICROBIAL PRINCIPLES AND PROCESSES FOR FUELS, CHEMICALS AND BIOLOGICALS," to be held at the Massachusetts Institute of Technology, Cambridge, MA. For more information contact: Director of Summer Session, MIT, Room E19-356, Cambridge, MA 02139.

August 19-30, IN-STORE BAKERY TRAINING PROGRAM, to be held in Manhattan, KS. For more information contact: Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

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 Commitee, 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, Kurssekretariatet, Lund Institute of Technology, P.O. Box 118, S-221 00 Lund, Sweden.

September 17-19, NEW YORK STATE ASSOCIATION OF MILK AND FOOD SANITARIANS, to be held at the Sheraton Inn, Syracuse, NY. For more information contact: D. K. Bandler, 11 Stocking Hall, Cornell University, Ithaca, NY 14853. 607-256-3027.

September 30 - October 2, ADVANCED SANITATION PROGRAM, to be held in Chicago, IL. For more information contact: Shirley Grunder, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

September 30 - October 11, IN-STORE BAKERY TRAINING PROGRAM, to be held in Manhattan, KS. For more information contact: Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

October 1-2, SOUTH DAKOTA STATE DAIRY ASSOCIATION CONVENTION to be held at the Ramada Inn, Sioux Falls, So.

Dakota. For more information contact: Shirley W. Seas, Ex Secretary, Dairy Science Dept., So. Dakota State University, Brookings, SD 57007.

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.

October 2-4, WORKSHOP IN FOOD FLAVOR: DEVELOPMENT, MANUFACTURE AND USE, to be held at the University of Minnesota, St. Paul, MN. For more information contact: Joanne Parsons, Office of Special Programs, 405 Coffey Hall, 1420 Eckles Avenue, University of Minnesota, St. Paul, MN 55108. 612-373-0725.

October 5-9, DFISA FOOD & DAIRY EXPO '85, to be held at the Georgia World Congress Center, Atlanta, GA. For more information contact: Bruce L. D'Agostino, Director, Public Relations, Dairy and Food Industries Supply Assoc., Inc., 6245 Executive Boulevard, Rockville, MD 20852-3938. 301-984-1444, Telex: 908706.

October 7-9, BIOTECHNOLOGY IN THE FOOD PROCESSING INDUSTRY, sponsored by the Department of Food Science and Nutrition, University of Minnesota. To be held at the University Radisson Hotel, Minneapolis, Minnesota. For more information contact: Lynette Marten, 405 Coffey Hall, 1420 Eckles Avenue, St. Paul, MN 55108. 612-373-0725.

October 21-23, STABILITY AND QUALITY CONTROL WORKSHOP, to be held in Palo Alto, CA. For more information contact: Tragon Corporation, 365 Convention Way, Redwood City, CA 94063. 415-365-1833.

October 21-25, 69TH ANNUAL SESSIONS OF THE INTERNATIONAL DAIRY FEDERATION, to be held in Auckland, New Zealand. For more information contact: H. Wainess, Secretary, U.S. National Committee of the IDF (USNAC), 464 Central Avenue, Northfield, IL 60093. 312-446-2402.

October 28-30, PCO RECERTIFICATION, to be held in Manhattan, KS. For more information contact: Shirley Grunder, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

October 28 - November 1, to be held in Manhattan, KS. For more information contact: Mrs. Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 55402. 913-537-4750.

November 5-7, TECHNOLOGY OF BAKING, to be held in Las Vegas, NV. For more information contact: Mrs. Donna Mosburg, Registrar, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502. 913-537-4750.

1986

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.

June 29-July 2, 29TH CONFERENCE OF THE CANADIAN INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY, to be held in Calgary, Alberta, Canada. For more information contact: Terry Smyrl, Ph.D., Alberta Horticultural Research Center, Brooks, Alberta, Canada, T0J 0J0. 403-362-3391.

July 15-19, PURDUE CANNERS TECHNICIANS MOLD COUNT SCHOOL. For more information contact: Dr. James V. Chambers, Food Science Department, Smith Hall, Purdue University, West Lafayette, IN 47907. 317-494-8279.

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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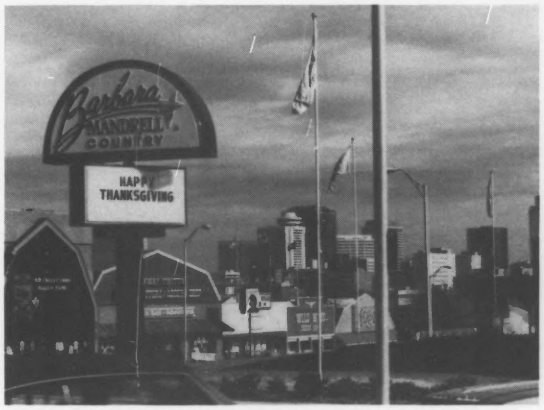

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