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Official Publication

International Association of Milk, Food and Environmental Sanitarians, Inc.

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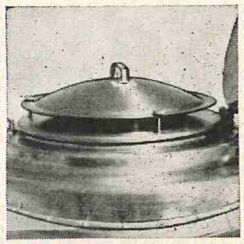

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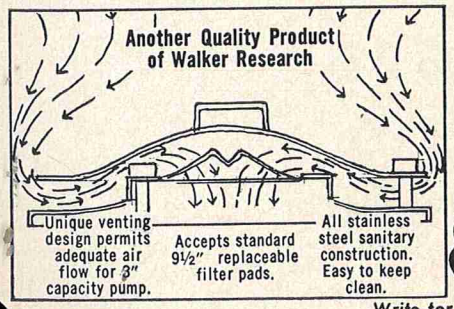

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JOURNAL OF MILK AND FOOD TECHNOLOGY

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Manuscripts are accepted, subject to editorial review. Authors are notified when a manuscript is received and also when it is submitted to the printer. Membership in the International Association of Milk, Food, and Environmental Sanitarians, Inc. is *not* a prerequisite for acceptance of a manuscript for publication.

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1. The *Style Manual for Biological Journals* (published by the American Institute of Biological Sciences, 3900 Wisconsin Avenue NW, Washington, D. C. 20016) has been adopted as a guide for authors in the preparation of manuscripts submitted for publication.

2. All manuscripts should be typed double-spaced on 8½ by 11-inch bond paper. Lines on each page should be numbered (in the left hand margin) to make review of papers easier. Use of paper with prenumbered lines is satisfactory. Side margins should be one inch wide. Pages should not be stapled together. Before a manuscript is submitted it should be read by someone other than the author(s) in order to eliminate errors and clarify statements.

3. The title should appear at the top of the first page followed by the author(s) name(s) and affiliation(s). Titles should be as brief as possible, contain no abbreviations, and be truly indicative of the subject matter discussed in the paper. Care should be exercised by authors in preparing titles since they are often used in information retrieval systems. *Good information can be lost through a poor title.*

4. Manuscripts reporting the results of experimental work generally should be organized as follows (in the order indicated): summary or abstract; an introductory statement of the problem and objective(s) of the work; methods or procedures; results and discussion (separate or combined); conclusions (only if needed and if different from the summary); acknowledgements, if any; and references.

5. General discussion type manuscripts should be divided into sections with appropriate sub-titles descriptive of the subject of the particular section.

6. Figures consisting of drawings, diagrams, charts and similar material should be prepared in India ink on tracing paper, white drawing paper or blue linen. Sheets should not exceed 8½ by 11-inches. Do not use paper with green, red or yellow lines. *Titles for all figures must be on separate sheets.* A letter guide should be used for all lettering on figures. Submit original figures rather than photographs of them.

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10. News items and announcements should be typed double-spaced with an appropriate title given at the top of the item. News of the activities of affiliate associations, members and events is particularly desirable. *Letters to the Editor are encouraged;* such letters must be signed by the writer.

FOOD SERVICE EMPLOYEE TRAINING VIA EDUCATIONAL TELEVISION[1]

FRANCIS M. CROWDER

State Board of Health

Columbia, South Carolina

Are food service employees (food handler) training courses worthwhile in a food protection program? This question has been asked by many professional sanitarians across our country and by this writer. Let us first analyze the problems encountered in a typical food protection program and see how these problems may relate to the need for a revised and progressive usage of mass communication techniques in the implementation of food service employee training.

A survey of 10% of South Carolina's food service establishments was conducted jointly by the U. S. Public Health Service and the State Board of Health during the summer of 1964 to determine the status of South Carolina's food protection program before commencing a new food protection program based on the USPHS Recommended Food Service Ordinance Code 1962. The baseline survey was made using the USPHS inspection form with 118 items. An analysis of the survey data revealed the following facts:

a. Average demerit score of 74.8 on 522 establishments.

b. Lack of uniform inspection procedures used by local health department sanitarians (frequency of inspection, follow-up, etc.)

c. Lack of uniform interpretation of existing food regulations among sanitarians conducting inspections.

d. Lack of uniform enforcement (grading and permit issuance, suspension and revocation).

In December 1964, the South Carolina State Board of Health adopted the 1962 USPHS Ordinance and Code, including the grading provisions and inspection form. A six-month grace period was granted to existing food-service establishments to become accustomed to the more rigid requirements placed on food protection practices. All previously awarded grades were taken down statewide and each food-service manager was to be informed by local sanitarians what must be done in order for his establishment to comply with the provisions of the new food regulation. During this six-month period, a schedule of compliance was to have been set up for each food establishment within the local sanitarian's jurisdiction.

Meetings were held across South Carolina conducted jointly by personnel of the PHS Regional Office and the State Board of Health. The purpose of these meetings was to explain the official interpretation of the food regulations to city and county health department sanitarians in order to obtain the highest possible degree of uniformity in administration of the new regulations.

Management seminars were conducted during a four-month period by the State Board of Health with some 4,200 food-service management personnel present. The purpose of the seminars was to promote further uniformity in understanding the interpretation of the new food regulations.

SURVEY SHOWS NEED FOR NEW EDUCATIONAL APPROACH

After the initial six-month educational phase of the new food program, it was found that sanitarians were fairly successful in obtaining installation of adequate equipment and facilities, especially in all newly constructed food-service establishments. But a follow-up survey conducted in early 1965 by the State Board of Health and the PHS Regional Office revealed that an average demerit score of over 40 still existed. Careful review of the follow-up survey showed that poor food protection habits on the part of employees caused by inadequate supervision and training of food service personnel by management accounted for better than 75% of the average demerit score remaining.

Why hadn't management implemented the food sanitation information taught during the educational classes, held early in the first six months of the food program? In these classes the requirements of the food regulations were explained in detail. Additionally, the interpretations were elaborated on during routine inspections by local sanitarians. No one knows the real and complete answer. Maybe management just took it for granted that they could continue their operation as in the past. It was evident that the health department had to re-sell management on the importance of good food protection practices. Furthermore, the task remained to make clear what the food regulation required to be in compliance with

[1]Presented at the 54th Annual Meeting of the International Association of Milk, Food and Environmental Sanitarians, Inc. at Miami Beach, Florida, August 14-17, 1967.

the operational items that revolve around good food protection habits.

We asked ourselves the question, "How does a limited sanitation staff effectively re-teach in a shorter period of time the material taught during the first six months of the new food program?" To do the job we would have to conduct 46 to 52 meetings in 46 counties throughout South Carolina to reach 5,500 management personnel who had been exposed to the requirements of the newly implemented food regulations during the conventional three hour food service management seminars. The answer was made simple with assistance from the 221 schools equipped with closed circuit educational television facilities scattered in all 46 counties of South Carolina. We decided to conduct a two-hour program on the food protection practices required by the food regulations over closed-circuit television with the idea that in one night we could theoretically reach the vast majority of management personnel and with the advantage that everyone would be exposed to the same interpretations of the food regulations. With the sincere effort and cooperation of sanitarians in 38 county health departments and two city health departments, local arrangements were made to conduct the first televised two hour food service management seminar in 74 classroom locations over the state.

DEVELOPMENT OF EDUCATIONAL TV PROGRAM

A list of the most often violated items of food protection practices was compiled and a television script with slides to portray the problems and interpretation was developed. A panel of food service industry management personnel agreed to ask the prepared questions to a panel of health department food consultants. Each question was answered both pictorially and verbally. Food-service management across South Carolina could now benefit from seeing the correct way of food protection practices versus the incorrect way.

Some of the subject matter discussed during the program was: food preparation, food storage, food protection, personal hygiene, dishwashing, food service, garbage storage, routine equipment cleaning procedures, and general housekeeping.

All programs should have a built-in evaluation, and this one was true to form. An evaluation form listing certain questions was passed out for management personnel to obtain their comments concerning the program. We wanted to know what the viewer thought about the presentation and whether future educational television programs would be worthwhile. The results from the evaluation forms would assist us in defining problem areas which would be encountered in the use of educational television food-service training courses of professional quality. We hoped also to broaden our television training into specialized areas of food preparation, food storage, dishwashing and other techniques that must be known and understood by management and employees to upgrade the food program in local areas if mass training by television seemed worthwhile.

Those in attendance responded (percentage-wise) to the questions as follows:

1. How did you enjoy the food service training class over television?
   - 50% Excellent.
   - 43% Satisfactory.
   - 3% Poor (data from area with poor T.V. reception).
   - 4% Not answering.
2. Do you like food classes over T.V. better than classes taught by one or more sanitarians?
   - 69% Yes.
   - 26% No.
   - 5% Not answering.
3. Did the television program try to teach too much or too little?
   - 10.6% Tried to teach too much.
   - 71.6% Could keep up with information being taught.
   - 10.4% Did not teach enough.
   - 7.4% Not answering.
4. Would you like to have the opportunity for your food service workers to be taught by a television food school covering personal hygiene, good food serving and preparation techniques, dishwashing etc. — at a later date if it were available?
   - 82.8% Yes.
   - 8.7% No.
   - 8.5% Not answering.
5. Other comments from food-service management in general were:
   - a. Two-hour program too long.
   - b. Have classes at different hours for shift-worker viewing.
   - c. Have professional speakers.
   - d. Go deeper into special areas of food preparation, dishwashing, etc.

RESULTS OF TRIAL PROGRAM

With two hours of television time, backed up by one week of script preparation, it was possible to reach 3,818 food-service management personnel and employees. With conventional lecture methods, four to five months would have been required to achieve a similar task. Not only was a large number of food service management personnel in attendance at the food protection seminar, but uniformity was achieved in that everyone was exposed to the same interpreta-

tion of the food regulations in the 38 counties which were able to take part in this experiment with only two weeks advance notice.

Many technical problems revolving around the use of educational television programming were uncovered. This was important since plans were now underway to apply for a research grant to produce an eight-hour series of in-service training programs for food service employees based on the USPHS Food Ordinance and Code, 1962.

After going through a period of food regulation enforcement of about one year, we were now firmly convinced that not only was it necessary to train food service management in their responsibilities of protecting the health of the "eating out public", but it was also pointed out from the re-survey data that now food service employees must be trained in correct food protection practices if the status of our food program was to show marked progress.

An even bigger question was now before us. How does one train 50,000 to 60,000 food service employees in a limited time, utilizing a small staff of resource personnel at the lowest dollar cost? Since we had had such success with the ETV training of management personnel, why not use the same mass communication technique and facilities in attempting to train this larger number of food service personnel. We saw no reason, at that time, why the job couldn't be done satisfactorily via ETV.

DEVELOPMENT OF A PERMANENT PROGRAM

Presently, the South Carolina State Board of Health, with the technical assistance of the South Carolina Educational Television Commission, The University of South Carolina, the USPHS and the National Restaurant Association, is developing a series of eight one-hour ETV programs with an accompanying one-hour examination under the auspices of a research grant from the Public Health Service, Division of Environmental Engineering and Food Protection. These programs will begin being broadcast statewide during October, 1967, to the estimated 50,000-60,000 food service employees in South Carolina. Regulations have just been adopted requiring attendance at food service training classes and satisfactory completion of the course (make 70% on questionnaire).

The approach to evaluation of food service training, by the use of ETV, will be to compare two methods of teaching principles and techniques of food protection to food service personnel. The experimental group will be taught by ETV and the control group by conventional classroom settings using instructors as have been utilized in the past. A few modifications will be made to insure that the control and experimental groups are equivalent except for the difference in teaching methods. Two different tests will be given; they will be administered to the control and experimental groups in the same manner. One test will be devised to determine the amount of course content previously learned by the students. The second test will be administered either via television to the experimental group or visual means in the control group to determine the effectiveness of each one-hour program.

In addition to the above test, a valid sample of the members of the experimental and control groups will be visited at their places of employment, in accordance with the inspection form used in connection with the USPHS Food Service Sanitation Ordinance and Code and a grade assigned to the establishment. A follow-up food service inspection shall be made by different survey officers at the completion of the training program to determine if improvements have resulted in the operational procedures and the employee's attitudes toward food protection. All data will be compiled in accordance with controls set forth by the Educational Research Staff of the University of South Carolina.

The purpose of the ETV series will be to (1) change employees attitude regarding the importance of food protection and (2) present factual information about food protection practices, hopefully, resulting in a reduction of the average demerit score of South Carolina's food service establishments. A correlated reduction in the number of cases of foodborne disease in 1967-1968 is expected from the high incidence of 1128 cases reported in 1964-1965.

Recently an article entitled "Evaluation of a Course in Food Handlers Training" in the May-June, 1967, issue of the Journal of Environmental Health presented the following statements: "First, the specific course content was demonstrated adequate to produce significant learning of factual material and significant favorable attitude change. However, one sanitarian instructor produced very little learning, while another brought his class almost to the top score on the information test, teaching roughly twice as much factual material to his students. One instructor produced a significant negative change in attitudes, apparently antagonizing students so that while they did learn the factual information presented, they were unfavorably disposed toward the course, toward sanitarians in general and toward the importance of proper food handling".

ADVANTAGES IN USING EDUCATIONAL TV

Educational Television, as we see it, can overcome most of the criticism attributed to conventional classroom food service training. Some of the advantages which a well-developed ETV series may have are to:

1. Teach more factual information, in a logical sequence, and systematically.

2. Promote uniformity – by telling large groups of food service workers the same information simultaneously throughout your jurisdiction. Uniformity of interpretation and enforcement will be easier to achieve if all concerned persons are presented the same basic information.

3. Give wide geographical coverage. With a limited staff of sanitarians and health educators, it would take months – even years – to conduct, by conventional classroom methods, enough training classes for 50,000-60,000 food service employees. Not withstanding the high employee turnover, ETV can give coverage wherever ETV is available in your area.

4. Lower the cost of training. Data from the ETV training of the 3300 management personnel in March of 1965 revealed that the per student cost for the two hour ETV course was estimated at 80c. The same amount of training, via conventional methods, scattered across South Carolina would have cost $1.24 per student. In addition, you would not have been assured of same level of presentation each time with conventional instructors, and you could therefore neither achieve the same degree of uniformity nor a constant level of enthusiasm.

5. Attempt to change viewers' attitudes concerning food protection practices. You can actually take the viewer anywhere via television to show scenes that will make points you have pre-programmed into the training series, resulting in a better chance of changing employee attitudes.

ETV is not the panacea for all the "ills' of our food protection programs, but it can play a major role in upgrading tomorrows food program.

Once the Food Service ETV Series has been completed, the South Carolina State Board of Health, Food Protection Section, will make the series available to all interested agencies.

A comprehensive report will be compiled from the evaluation data and a copy made available to all those interested agencies on a first-come–first-served basis. In addition 8 sets of 35 mm color slides, that teach the food service training themes, with accompanying script, will be available at a cost fee.

AIR POLLUTION LAWS JUMP THREEFOLD IN 1967

Reflecting growing urgency and public concern, the various states in 1967 enacted more than three times the amount of air pollution control, noise control and solid waste disposal legislation they approved the year before, says the Commerce Clearing House of Chicago.

Well over 100 laws, touching on air pollution controls, tax exemptions for control devices, pollution control commissions, waste disposal and incinerator controls, noise abatement and motor vehicle emission devices, were passed across the country as compared with just 34 such enactments in 1966.

Tax exemptions, license credits and other incentives designed to eliminate air pollution were approved in Illinois, Massachusetts, Minnesota, Oregon and Washington with most benefits taking the form of property and sales-use tax relief. Formation of air pollution control commissions, councils, agencies and boards were approved in Arizona, Connecticut, Florida, Idaho, Minnesota, Nevada, New Hampshire, New Jersey, Oklahoma and Tennessee.

Problems of trash disposal and incinerator control devices are covered in new laws of Colorado, Florida, Massachusetts, New York, Oregon, Rhode Island, South Carolina and Vermont.

On the state compact front, Connecticut, New York and New Jersey have okayed their entrances into the Mid-Atlantic States Air Pact which would also include Delaware and Pennsylvania. The pact is designed to enforce regional rules on air pollution. Missouri has approved the proposed Kansas-Missouri Air Quality Compact which creates a single bi-state agency, the Kansas-Missouri Air Quality Commission, which will coordinate air pollution control activities of federal, state and local agencies in the area. Similarly, Ohio has approved a compact with West Virginia to control interstate movement of air pollutants through the establishment of an interstate agency with powers to prevent, abate and control interstate air pollution.

Compacts such as these are entered into because air pollution knows no geographical boundaries. Agencies formed under these compacts receive the authority, by virtue of laws passed by the member states and Congress, to enforce certain regulations of an interstate or, if several states are involved, of a regional nature.

PUBLIC HEALTH TRAINING FOR SANITARIANS[1]

MORTON S. HILBERT

Associate Professor of Environmental Health

University of Michigan, Ann Arbor

Man is inexorably bound to his surroundings. He depends entirely on his surroundings to provide him with the materials necessary to fulfill his needs for life. These surroundings are identified by the word "environment." Until man entered the scene, a delicate but stable equilibrium was maintained between environment and free living organisms. The capacity of the environment for renewal was not exceeded by the demands placed upon it by other organisms until man became a part of the environmental scene. The capability of the environment to recycle contamination was fully commensurate with the rate of production of contamination by other organisms. The state of balance is aptly described by the "fitness of the ecosystem."

Man, with his scientific and technological skills, began at an early stage of his development to shape the environment to suit and satisfy his needs and requirements. As a result of man's development, the ecosystem has been somewhat altered due to the output of detritus from the technological establishments and devices which man has developed. There has been a continual accumulation of pollution in air, water and soil. The rate at which man produces such pollutants is far in excess of the capacity of the natural processes to recycle the wastes of modern living. Environmental pollution of many types has been the consequence. It is the role of the sanitarian to apply his special knowledge and skills to the problems of this imbalance in the ecosystem in an effort to provide an environment in which man may live in harmony with his environment.

Recent expansion in the interests of environmental problems has placed considerable emphasis on problems of air, water and soil pollution which have long been the concern of environmental specialists. There are other areas of important concern to the environmentalist which should also be included in a consideration of the need for the development of a cadre of well-trained, qualified environmental specialists. The problems of disease and the need for the development of an environment in which man may thrive rather than merely survive are also important considerations in the training of environmental health workers.

The World Health Organization definition of health indicates that environmental health is a program of activity which is aimed at providing an environment which will assure the complete physical, mental and social well-being of man, and is not merely aimed at the prevention of disease or infirmity.

INCREASING NEED FOR TRAINED PERSONNEL

There is a continuing acceleration in the need for personnel trained in the many specialized fields of environmental health. As the speed of national growth and technological advancement increases, problems of the environment become increasingly important and demand the attention of well-trained individuals to effectively protect the health of the general population.

As a profession, the field of environmental health offers a great variety of areas of activity. It draws upon a diversity of skills often requiring several in the same individual, and upon a firm foundation in the basic physical, biological, and social sciences. The field embraces the traditional function of protecting man from sickness and death through sanitation of his environment, the prevention of communicable diseases, and the organization and administration of measures to accomplish these ends. It embraces newer functions deriving from advances in science, more effective prevention of illness and the maintenance of conditions favoring optimum health for the population as a whole.

In a discussion of the public health training for sanitarians there are a number of types of training activities which should be considered. The first of these would include programs of graduate training; the second would involve a consideration of undergraduate training for environmental health; and the third would deal with the training of environmental technicians. A fourth area of training which should receive consideration would involve inservice training programs and the short-term training activities of an inservice nature.

The educational objectives of graduate training for sanitation personnel start with the specific disciplines and subject areas that are basic to public health

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[1]Presented before the 54th annual meeting of the International Association of Milk, Food and Environmental Sanitarians, Miami Beach, Florida, August 16, 1967.

methods, such as the biological sciences and the applied fields of sanitation, biostatistics and epidemiology. However, it goes beyond these to include consideration of the total relation of man to both his physical and social environment and the effect of these relationships upon his physical, and mental well-being.

ENVIROMENTAL HEALTH COVERS A BROAD FIELD

The total field of environmental health is extremely broad and offers the sanitarian a variety of opportunities to specialize. These areas of specialized research, investigation and study include problems of air pollution, accident prevention, animal diseases which are transmitted to man and the relationship of animals to the problems of diseases. Food sanitation is an extremely important area of specialization in the field of environmental health. It includes consideration of milk and food technology, of sanitation problems connected with milk and milk products, as well as a study of meat production, processing, and distribution. The area of housing in its broadest ramifications presents opportunities for studies in a number of fields with a close relationship to planners, architects, engineers, political scientists, economist and environmental sanitation experts.

Industrial and occupational health is another important area of study open to the members of the sanitation profession and deals with problems of exposure of man in working environments. Closely allied to the problems of work places are problems of air pollution with the many aspects of sampling, analysis and the application of adequate control measures to prevent and eliminate pollution of the atmosphere within the work places as well as in the community near the sources of pollution.

Another important area of activity which is open to study for the environmental specialist involves vector control with the problems related to insects and rodents and the many diseases which are transmitted through this portion of our environment.

In the broad field of environmental concern, a most important aspect of community life has been receiving increased attention of environmental specialists, and this deals with problems of solid waste disposal. New courses are being developed in universities throughout the nation concerning problems of garbage and refuse collection, transportation and disposal. These programs are of vital concern to many sanitation personnel. Much research is being developed at the present time to deal with this most important aspect of community living.

The problems of institutions including hospitals, nursing homes, convalescent homes, schools, and other public institutions present another area of vital concern to the sanitarian in which he can receive training at a graduate level.

Some of the most important work which is being conducted at graduate schools throughout the nation in the field of environmental health deals with water supply, water treatment, and water distribution, as well as with problems of waste water treatment and disposal. Problems of water conservation and water supply need the attention of many qualified, well-trained sanitarians who can receive the basis for future field service through a graduate program in this important field of environmental health.

Radiological health is another area of concern to the sanitarian in this age of rapid change and growth in technology which affects the environment of the people of our communities. Many students, scientists, and investigators are currently involved in the study of radiation and its effect on man and his environment.

Thus, we see that the opportunity for study is extremely broad and involves the many problems with which the sanitarian needs to be engaged when working in local, state or federal health agencies.

TRAINING AT THE GRADUATE LEVEL

Ability to provide an adequate service for the community is of necessity developed at a graduate level. In many of the areas which have been mentioned, the sanitarian could specialize in a particular field of technology in preparation to work in one of the many technological fields which relate to environmental control. In such cases he might seek graduate training in any number of graduate schools and colleges throughout the nation. On the other hand, if he wishes to become a leader in the field of public health administration with a specialty in environmental health, he might consider the programs of instruction which are provided at one of the fourteen schools of public health in this country.

The basic objective of most schools of public health is to prepare the individual for a leadership role in public health. If a sanitarian chose to enter a school of public health, he would expect to receive an educational program which would train him as a leader in the field of environmental health. In this case, he would be expected to have his undergraduate degree in one of the biological sciences or engineering, and would probably specialize in one of the areas of environment such as water supply, waste disposal, radiological health, industrial hygiene, or general environmental health administration. On the other hand, he might choose to become a non-administrative specialist in one of the areas of environmental health and would add to his graduate training in public health extra course work in a

specialized field such as radiological health or food technology. In some cases his major interest might lie in research, in which case he would proceed toward a doctoral program in a more specialized field of environmental health, and continue during the course of his future career as a researcher in one of the areas of environmental science.

In order to be admitted to a graduate school of public health it is ordinarily expected that the sanitarian has an undergraduate degree in the biological, physical, or chemical sciences with a major consideration or concentration in one of the sciences, preferably in chemistry or biology. Others who are admitted to schools of public health may have an undergraduate degree in which they specialize in applied sciences, such as food technology, dairy manufacturing or animal husbandry. It is on the basis of these undergraduate studies that the graduate work is developed and extended into more concentrated areas of specialty, and in some cases into a general field of application of the various sciences to the field of environmental control.

In addition to the undergraduate degree in one of the allied sciences, the applicant for admission to the school of public health is expected to have at least three years of experience in a health agency or in work closely related to environmental health in the field. It is believed that this experience following the undergraduate work will prepare the student to more readily understand the importance and the application of the program of education which is developed at the school of public health. In those cases where the student may wish to pursue his graduate education in public health following the completion of his Bachelor of Science degree, he may be admitted to schools of public health on a two year program. In this way the additional graduate level work will add to his undergraduate training and will strengthen his ability to work successfully in the field following his graduation from the school of public health.

TRAINING IN SPECIALIZED FIELDS

For those students who wish to specialize in one of the areas of environmental control rather than in the more general field of public health a number of schools of public health offer an opportunity for the student to take a program leading to a degree of Master of Science in Environmental Science. For those who are concerned with a Master of Public Health degree program, more generalized course work is specified and they are expected to concentrate a portion of their time on the general field of public health as it relates to the environment. The Master of Science program, on the other hand, provides a program of instruction which concentrates in fields of water supply, stream pollution control, radiological health, food technology, or some of the other more specific and concentrated areas of environmental science.

At The University of Michigan School of Public Health in the Department of Environmental Health, for example, a combined program with the Master of Public Health activity is offered with a number of other schools and colleges on the Campus. There is a combined program in environmental health and sanitary engineering. This is a program with a minimum of 60 credit hours of course work required which usually necessitates a two-year residency on the campus. At the end of this time the student may have completed the requirements for the two Master degrees, Master of Sanitary Engineering and a Master of Public Health.

Another combined program is developed with the School of Public Health and the School of Natural Resources which is entitled, "Program in Environmental Planning and Water Development." Other programs can be developed for the individual needs and interests of the student on a combined basis with the School of Public Health and other schools and colleges on the Campus.

For outstanding students who are interested in further study and research, doctoral programs are available in the field of environmental health, study and research. The field of radiological health has offered an opportunity for doctoral programs in a number of public health schools throughout the nation. At The University of Michigan a doctoral program has recently been developed in the field of institutional studies. The doctoral programs usually require approximately three years of work following the Bachelor of Science degree, and require original research and a dissertation.

ADVANCES IN TECHNOLOGY REQUIRE QUALIFIED PERSONNEL

The need for well-trained, well-qualified sanitation personnel is growing rapidly each year with the rapid events in technology and in the standard of living accompanied by new products, new methods of processing, production and distribution of foods, the advances in transportation and the rapid changes in man's environment. There is a continual need for the upgrading of educational qualifications of persons who render sanitation services and supervise the services of environmental health at the local, state and federal level. There is also a continuing need for well-qualified sanitation personnel in private industry, in many of the industries which are

closely related to the development of products which relate to man and his environment.

The new program at The University of Michigan in the field of institutional environmental studies has been designed to meet an ever-increasing need for well-qualified individuals to review the problems of infections in hospitals and to supervise the control measures necessary to protect against the spread of infections in the institutions throughout the nation. Graduates of this program will find employment in federal agencies, in state agencies responsible for the administration of hospital programs in large hospitals, and as consultants to groups of smaller hospitals in metropolitan areas throughout the country.

EXPANSION OF UNDERGRADUATE PROGRAMS

With the rapid expansion of the interest in problems of the environment and the increased public concern for environmental control, there has been an accelerated demand for the development of undergraduate training programs in schools and colleges throughout the country in the field of environmental science. A four-year undergraduate program in environmental science is being offered by a number of universities and colleges throughout the country, which prepare the graduate with an excellent background in the physical and biological sciences, with specific application to problems of environmental control. In many of these programs the social science aspect of the environmental management program has been incorporated in such a manner that the graduate from these baccalaureate programs is well-qualified to develop programs of sanitation in health agencies and industry throughout the nation.

It has been indicated by some that the graduates of an undergraduate program would enter the field of environmental health at the level of sanitation supervisor provided adequate experience had been offered, either in a work-training program or through some type of indoctrination arrangement with the employing agency. It has been considered that the training at the Master's degree level would aim primarily at the development of supervisory level personnel who would be primarily responsible for planning and directing environmental health programs. Another level of training which is being considered at the present time involves the development of environmental health technicians.

For many years there has been developed a group of environmental specialists who have undergraduate training in the field of environmental health or graduate training from schools of public health only to send them to work in local health departments where they are employed for routine field inspection programs. There are those who believe that the talents, abilities and professional services of these well-trained individuals could more appropriately be directed toward program planning, administration and development, while certain segments of the more routine activities of environmental health agencies could be adequately handled by a technician-type of employee.

Positive steps are currently underway to develop a two-year training program in a number of junior colleges throughout the nation which would emphasize educational programs to train environmental technicians to perform tasks in environmental health programs. These technicians would have a basic understanding of the principles of sanitation as related to physical and biological science. It would be expected that some of these technicians, after working in the health agency, would proceed to complete other work in a university or college and could eventually finish their baccalaureate degree program in environmental health. If the profession of sanitation is to proceed to attain the levels of recognition which it justly deserves, careful consideration should be given to the professional activities of the sanitarian in the local, state or federal health agencies. The wise use of environmental technicians could do a great deal toward the development of the recognition of the professional status of the qualified, well-trained sanitation specialist.

INSERVICE TRAINING

Another important aspect of training for environmental health workers includes the type of training which could be termed as "inservice training" which is accomplished through symposia, short courses, meetings of national associations, and through training programs developed by individual health departments, including some types of staff meetings. With the rapidly changing technologies and the continual impact of these changes on the problems of control and management of man's environment, the knowledge and understanding of the environmentalist which was gained during his formal training program needs continual and frequent updating. Many state health departments and some local health agencies have developed outstanding and extensive courses of inservice training which are intended to raise the level of understanding of the environmental health personnel. The medical profession for many years has held frequent seminars and special educational programs to bring the members of the medical profession up to date on the latest techniques in the field of medicine. The development of this type of inservice training in the field of environmental health is to be encouraged. The areas which are conducting

programs of this type are to be commended for their efforts in this important phase of the instruction of environmental health workers. Federal and state funds are available in a number of categorical programs for this type of training and the need for expansion of such programs at all levels of government is apparent throughout the nation.

NEED FOR ADEQUATE COMPENSATION

One of the deterrents to the development of a large cadre of well-qualified sanitation personnel in this country has been the lack of vision on the part of administrative bodies to provide necessary financing for adequate salaries of these important, highly-qualified, well-trained individuals who guard the health of the people of the communities through a control of the environment. There is a continual need for upgrading of salaries in this field of public health, and steps need to be taken to raise salaries commensurate with the responsibilities of the task at hand. One of the deterrents to securing adequate remuneration for persons adequately trained in the field of public health environmental control, is that there has been a tendency to provide short-term training for less qualified individuals. One should keep in mind that the field of environmental health involves a rapidly growing body of knowledge in an expanding field of technology which cannot be taught or learned in a number of short courses. If health agencies and governmental units of the nation continue to employ poorly qualified individuals at low salaries, who can at best perform only a superficial service, the adequacy of salaries throughout the nation will be difficult to secure.

Stipends and traineeships are available to qualified sanitarians on a competitive basis. Such traineeships are available through universities, schools of public health and departments of environmental health. Fellowships and traineeships are also available through state health departments and some direct grants are made by the United States Public Health Service and other federal agencies. Students with good experience backgrounds and high educational qualifications may find that financing is available for one-year and two-year Master degree programs, and for an extended period of time for doctoral candidates.

The programs of graduate education and study in the variety of fields of environmental control are numerous and extensive. The pursuit of study in this rapidly changing technological area of man's environment is an invitation into a fantastic world of expanding scientific opportunity. The opportunities for well-trained, well-qualified sanitarians are almost unlimited at the state, local, federal, and international level; and it behooves all of us who are concerned with man's environment in which we live to encourage qualified persons to continue research and study in this important area, environmental science.

EMERGENCY FOOD PLANS TAKE SHAPE

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"Be Prepared," the Boy Scout motto, could serve as the theme of the U. S. Department of Agriculture's emergency food management program. Assigned to the Consumer and Marketing Service of the U. S. Department of Agriculture for development, this program seeks to maximize ability to manage the Nation's food supplies under conditions of nuclear emergency.

As a part of its regular defense preparedness activities, C&MS has developed two proposed standby food orders. The more important of these, the "food management" order, is regulatory in nature. It affords a flexible framework within which suborders could be issued to meet specific needs at any time and place. It is designed for use in a nation fragmented by nuclear attack and can be issued and administered locally as part of a national program, but without national direction.

Its purpose is to help the food industry to function by insuring that available food supplies are conserved and used in an orderly way; and that food is distributed equitably. Intended as a temporary measure, it would be replaced by more specific procedures when conditions improve.

The greatest possible reliance will be placed on the food industry which will be encouraged to feed the Nation through normal commercial channels if at all possible. There would be no "take-over" of the food industry. USDA realizes that processing, storage and distribution of food during an emergency can be done successfully only by those who do it regularly.

Although food management would be accomplished with a minimum of artificial barriers in the form of regulations,

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THE ROLE OF THE PUBLIC HEALTH SERVICE'S NATIONAL COMMUNICABLE DISEASE CENTER IN THE SANITARIAN'S PROGRAM[1]

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ABSTRACT

The National Communicable Disease Center is the Public Health Service agency for the control of all infectious and certain other preventable diseases. The Center functions through organizational elements called *programs*—Epidemiology, Laboratory Improvement, Training, Tuberculosis, and Venereal Diseases. There is no program at the Center that does not affect the professional sanitarian as a member of the public health team.

The Center's services in the field of epidemiology, in consultation, in laboratory aids to diagnoses, and in practical procedures affect directly the sanitarian's own program. The publication, *Morbidity and Mortality Weekly Report,* reports epidemics caused by organisms disseminated by food, milk and water. This information should be invaluable to the sanitarian.

The Training Program has the more significant effect on the sanitarian's effort to control infectious diseases. It provides not only training in the field of sanitation but provides services that state resources cannot afford, among which is help in developing and improving state training programs by producing training aids and the stimulation to use them.

The Center's training program's contribution to the sanitarian consisted of twenty-three course subject areas directly connected to disease control by methods involving the alteration of environmental factors. In these courses, attended by 2,213 persons, 42% were engaged directly in the sanitary sciences. Of the 24,000 total enrollment in 1966, 66% of the persons were from local and state health departments.

The National Communicable Disease Center is the Public Health Service's agency for the control of all infectious and certain preventable diseases. For many years the Center's activities were confined to the United States, but they have now been extended to 43 other countries.

During World War II, the southeastern part of the United States was the site of many troop training areas. This location had many advantages, but one outstanding disadvantage—there was a lot of malaria. In 1942, the Public Health Service set up an organization called "Malaria Control in War Areas" to do just what its name suggested—control malaria in war areas and in the areas around army camps and other defense installations. The organization was also given responsibility for the control of typhus fever.

By the end of the war, malaria was under control, but servicemen were bringing other exotic diseases into the United States as they returned from their stations abroad. Dr. Joseph Mountain, then Chief of the Bureau of State Services in the Public Health Service, planned an organization, to be composed of "centers" located throughout the country, that would deal with this situation as a part of its more general mission—which would be to make available to all of the states certain facilities and capabilities that they could not afford individually. The Communicable Disease Center, activated in July, 1946, was the first of these "centers."

The recent reorganization of the Public Health Service has provided for a "Bureau of Disease Prevention and Environmental Control." This bureau will have five centers located outside the main federal complex in the Washington area. The National Communicable Disease Center, as our organization was renamed at the time of the reorganization, is one of these centers. The others are the National Centers for Air Pollution Control, Chronic Disease Control, Radiological Health, and Urban and Industrial Health.

The National Communicable Disease Center functions through organizational elements called *programs*—Epidemiology, Laboratory Improvement, Training, Tuberculosis, etc. The Center's general fields of endeavor will be mentioned since they bear directly on the work of the sanitarian. There is no program at the Center—none whatever—that does not in some way affect the professional sanitarian as a member of the public health team.

The original concept of supplementing and supporting the state and local health departments by supplying special services is still in effect. Many special services are supplied that the state or local agencies cannot maintain—cannot for two reasons: (*a*) the initial cost is high, and (*b*) the unit cost, because of infrequent demand for this sort of thing, is prohibitive when the service *is* needed. These special services consist of research, training, consultation, and direct

[1]Presented at the 54th Annual Meeting of the International Association of Milk, Food, and Environmental Sanitarians, Inc., Miami Beach, Florida, August 14-17, 1967.

assistance to the states so that they can develop more effective programs to prevent or to detect and diagnose the infectious diseases.

EPIDEMIOLOGY PROGRAM

Some of the activities for which the Center is best known come under the jurisdiction of the Epidemiology Program; among them—surveillance of communicable diseases throughout the country and immediate action to halt epidemics wherever they occur. The Epidemiology Program trains physicians, nurses, veterinarians, statisticians, sanitarians, and others in practical field epidemiology, primarily through the Epidemic Intelligence Service—"the EIS." This service is on call to supply teams of qualified medical epidemiologists to investigate epidemics anytime, anywhere in the world.

Data on notifiable diseases submitted to the Epidemiology Program by state and local health departments and collected by EIS officers and professional staff members are compiled and published in the *Morbidity and Mortality Weekly Report* and in periodic surveillance reports that summarize trends in infectious diseases, such as salmonellosis, hepatitis, shigellosis, polio, diphtheria, measles, and influenza. These reports are obtainable without cost by writing to the Director, National Communicable Disease Center.

LABORATORY IMPROVEMENT PROGRAM

The Laboratory Improvement Program furnishes training, consultation, evaluation, and diagnostic services to state health departments; it also undertakes applied research to solve specific problems. If biological reagents to meet certain needs and requirements are not available from commercial outlets, it may produce them for states and other users involved in public health work.

VACCINATION PROGRAM

Under the Vaccination Assistance Act of 1962, the Center provides consultation and personnel to assist state and local health departments to persuade the public to accept protective measures against diphtheria, pertussis, tetanus, polio, and measles. Funds are granted to health departments to purchase vaccine for pre-school children and to provide epidemiologic and laboratory surveillance.

MOSQUITO PROGRAM

The National Communicable Disease Center takes part in a hemispheric effort to eliminate the health hazard posed in some countries of the Western Hemisphere by the *Aedes aegypti* mosquito. Funds are provided, and technical personnel assigned, to those state health departments that are participating in this country's effort to help end the yellow fever menace.

AUDIOVISUAL AIDS

The Public Health Service Audiovisual Facility at the National Communicable Disease Center produces, acquires, and distributes audio and visual educational materials in the medical and technical fields. The Facility's film library has about 19,000 prints of films; they are viewed by some 3-1/2 million persons each year.

ASSISTANCE TO THE SANITARIAN

These, then, are the highlights of the Center's activities that are of general interest to the sanitarian. There are, however, many other activities that are important, whether from the standpoint of the sanitarian as an individual or as a member of the public health team.

The Center's services in the field of epidemiology, in consultation, in laboratory aids to diagnosis, and in practical control procedures can directly affect the sanitarian's own program. The Center's publication, *Morbidity and Mortality Weekly Report,* should be familiar to every sanitarian. The reports of epidemics caused by organisms carried by food, milk, and water are valuable guides when the sanitarian evaluates his efforts to prevent just such outbreaks in his own jurisdiction. The experiences of others can have a tremendous effect in educating the sanitarian. The Center's *Shigella Surveillance Report* and *Salmonella Surveillance Report* (published periodically by the Epidemiology Program) provide information on the sources of salmonella and shigella infections and other data relative to these infections in much the same way—but in more detail—than the *Morbidity and Mortality Weekly Report* which covers all communicable diseases.

Other services of the Center are important to the sanitarian, but the organizational element known as "Training Program" has the most significant effect on his efforts to control infectious diseases. All courses—offered by whatever part of the Center—have a direct bearing on some aspect of communicable disease control. The Training Program provides not only training, but also various other services that state resources alone do not afford—among which is help in developing and improving state training programs. The Training Program also produces training aids and stimulates state and local health training activities to use them.

The Training Program has a staff of nearly 50 professional training persons—education specialists, en-

gineers, entomologists, nurses, public health advisors, physicians, sanitarians, training specialists, and veterinarians. In addition, the Center's total resources and staff participate in and help the Training Program to develop its various training activities. The Center's staff members, who are engaged in research and operations, furnish technical guidance in epidemiology, laboratory procedures, and environmental factors. The Program's courses are further reinforced by the services of consultants from official and nonofficial voluntary health agencies and from universities, particularly when new ideas and developments are involved.

There are four categories of training activities: headquarters, field, instant, and homestudy. Some of the "headquarters" courses cannot be given anywhere other than Atlanta because of the highly specialized equipment needed for instruction, but with few exceptions, headquarters training activities can be carried on in any state. "Field" courses are adaptations of headquarters courses, set up after consultation with representatives of cosponsoring organizations to eliminate or reduce inapplicable general content of the course and to substitute for it specific information that applies to the particular local situation and its current problems.

The "instant" training activities provide instruction on communicable disease control—at the time and at the place of actual outbreaks. This sort of training can be given with only 24 hr notice. Subjects now covered are arthropod-borne encephalitis, leptospirosis, malaria, rat bite, spotted fever, plague, tularemia, Colorado tick fever, and techniques for investigation of vector-borne diseases.

To realize their full potential in the control of communicable diseases, state and local health organizations must provide training in basic environmental sanitation. By circumventing several obstacles (loss of work time, the restrictions imposed by costs of travel, instruction, and accommodations), National Communicable Disease Center homestudy courses make such training available to those who can get it in no other way. These homestudy courses are intended to supplement existing programs, not to replace conventional training. Their titles include "Basic Mathematics for the Sanitarian," "Communicable Disease Control for the Sanitarians," "Insect and Rodent Vector Control," and "Environmental Sanitation." About 1,500 persons are now taking the homestudy courses. At the present time enrollees are from 46 states and a number of foreign countries.

In several states all recently employed sanitarians are required to complete the homestudy course "Environmental Sanitation" before they can be recommended for a scholarship to support advanced training.

During the fiscal year, 1966, the Center's Training Program offered 23 courses that had a direct bearing on control of diseases that are caused by organisms or agents whose transmission can be controlled by modifying environmental factors. About 2,200 public health workers attended these courses; 49 categories of public health endeavor were represented in this group. Engineers, sanitarians, sanitation inspectors, milk and food personnel and sanitation technicians—workers whose business it is to prevent disease by modifying the environment—accounted for 962 of the enrollment. Of course, other categories of personnel are also involved in environmental sanitation, but this group's direct responsibility is indicated by its members activities.

Among the course titles offered are: (*a*) Environmental Control of Communicable Disease, (*b*) Administration in Environmental Health, (*c*) Epidemiology and Control of Salmonellosis, (*d*) Microbiology of the Hospital Environment, (*e*) Organization of Inservice Training, (*f*) Preparation and Use of Training Aids, (*g*) Principles of Epidemiology, (*h*) The Sanitarian and the Control of the Hospital Environment, (*i*) Practical Procedures for the Control of Food-Borne Diseases, and (*j*) Epidemiology in Environmental Health.

There were also nine courses that dealt with more specialized matters of insect-and rodent-borne diseases and their control.

To sum up, the Center's contribution to communicable disease control, and particularly to the activities of the sanitarian, during 1966 were as follows: Enrollments—nearly 24,000. Of these, nearly 16,000 (about 66%) came from state and local health agencies. The Center's Training Program gave 23 courses on subjects directly connected to disease control by methods involving alteration of environmental factors. In these 23 courses, 962 (42%) of the enrollment of 2,213 were engaged in some aspect of the sanitary sciences.

PESTICIDE RESIDUES IN FOOD[1]

The use of chemicals in food production is not new. It probably began when a cave dweller first observed that food left in the smoke of the fire or the salty residue of sea water did not disappear into a mass of insects before he could eat it.

If we were to correlate chemical discoveries with the resulting effects on food production, especially when accompanied by similar advances in other sciences, we would most likely find that our bountiful supply of food and fiber was made possible by such advances.

There are many uses for pesticide chemicals for purposes other than food production. Large quantities of these chemicals are used in disease prevention, such as mosquito control; in fiber production, such as cotton dusting; in forest conservation; in highway weed control. Pesticides do not stay put. They drift through the air and are contained in the dust and dissolved or suspended in the water systems of the world. The possibilities for potentiation and interaction are innumerable. When drugs, food additives, air pollutants, and other similar factors influencing man's total environment are added to the list of pesticides, there is reason to exercise caution and to maintain control. It becomes imperative when the individual cannot exercise a choice concerning exposure to these factors.

The comparatively simple chemicals, lead, arsenic, mercury, bromides, sulfur, of a quarter century ago have been augmented by several hundred complex, synthetic, organic, chemical compounds. They come in a wide variety of basic chemical structures: chlorinated ring compounds, organic phosphorus, Carbamates, and some whose chemical identity is not fully known. They are recommended for a multitude of uses, ranging from highly specific to broad spectrum applications. Some decompose or dissipate rather rapidly. Others are remarkably persistent.

There is a wide variation in the acute toxicity levels and in the "no effect" levels of various pesticide chemicals as measured by test animals. The interpretation of data obtained on laboratory animals to humans is not a precise mathematical exercise, although it is generally acceptable. By nature, however, pesticides are toxic and, quite naturally, there is a substantial and growing public interest in toxic residues from all sources in man's environment and, more specifically, in food.

[1]From an article by R. E. Duggan and Keith Dawson, U. S. Food and Drug Administration, Washington, D. C. originally published in FDA Papers, June, 1967.

FDA Activities in Detection and Control

Historically, the Food and Drug Administration has exercised control of such residues in foods. The almost explosive use of toxic chemicals in agriculture, beginning in the 1940's, led Congress to pass an amendment to the Food, Drug, and Cosmetic Act in 1954. This amendment directed that FDA establish safe and legal tolerances for pesticide chemicals on raw agricultural products, after USDA approved the usefulness of such chemicals. Tolerances have been, and are being, established on the basis of raw foods as shipped in interstate commerce.

A tolerance is granted only on the showing that the residues on the food are safe by pharmacological tests at levels greatly exceeding those remaining on the food. Furthermore, a tolerance will not be granted for levels exceeding those necessary in the production of the food even though the pharmacological data shows that a higher level is safe.

Tolerances are not additive. For example, if two similar chemicals each have a tolerance of 1 ppm on a food, this means that both chemicals combined may not exceed 1 ppm. Specific regulations have been promulgated for those instances where more than one pesticide chemical is present. Regulations provide that processed foods will be legal if prepared from raw foods containing legal residues and if the residue in import samples follow in order:
on the raw product. One of the factors given consideration in establishing tolerances is the total amount of pesticide chemicals and combinations which might be consumed over extended periods of time.

Every year, the FDA determines the amount of pesticide chemicals in thousands of samples of food in the enforcement of the tolerances. These analyses are made on foods as shipped in interstate commerce. Shipments containing excessive residues may be removed from the market by seizure and the shipper may face legal proceedings.

In the surveillance program, samples are collected throughout the year at producing, shipping, and destination points. Objective samples are surveillance-type samples; there is no reason to suspect that residues will be found. FDA differentiates between objective samples and those selected for examination because of information or other causes indicating the presence of excessive residues.

Modern pest control often requires use of more than one chemical to achieve the desired result. The FDA has been instrumental in developing and perfecting multiresidue methods, which permit the ex-

amination of a sample for many residues by a single test. The analytical procedure used on all samples will detect the presence of 54 specific pesticide chemicals.

During a 3-year period (1963-1966) almost half of the objective samples contained residues and 29 percent contained more than one pesticide residue. The 10 most commonly found pesticide chemicals in domestic samples and the 10 most commonly found in import samples follow in order:

Domestic Samples	Import Samples
DDT	DDT
DDE	DDE
Dieldrin	Dieldrin
TDE	TDE
Heptachlor Epoxide	BHC
Lindane	Lindane
BHC	Aldrin
Endrin	Kelthane
Aldrin	Heptachlor Epoxide
Toxaphene	Endrin

The primary objective of FDA is to protect the consumer from eating foods containing significant amounts of these poisonous substances. The tolerance procedure and the surveillance program with accompanying regulatory control provides information only on the foods as shipped. Foods are washed, trimmed, cooked, and prepared in many different ways which affect the remaining residues. For this reason, tolerances are established on the food as shipped in interstate commerce, because it is not practical to establish tolerances at other points in the food processing procedure.

STUDIES AT THE CONSUMER LEVEL

As an additional precaution and as final assurance that the primary objective is being reached, it is necessary that information be obtained on food as it is actually consumed. The tolerance concept does not anticipate, as a practical matter, that all foods will contain residues at the tolerance level for all chemicals for which a tolerance has been established, or even that all of a single food will always contain a residue at the tolerance level. Actual experience throughout the years proves this to be a valid concept. The safety factor included in establishing tolerances does take care of isolated situations of this nature.

Several investigators have stated that foods are the major sources of pesticide chemicals in man. There has been relatively little information concerning the kind and amounts of residues in foods as they are eaten. The "market basket" or "total diet" studies by the Food and Drug Administration provide the most reliable index of the residues being consumed in the diet in the United States.

Briefly, these studies consist of purchasing in retail food stores, as would any consumer, a diet list of 82 foods in a quantity sufficient to satisfy the Nation's largest appetite, a 17- to 19-year-old male, for 2 weeks. The diet list was developed by the Household Economic Research Division of the USDA.

The food is prepared for the table by dieticians. It is separated into 12 similar kinds or classes of foods to avoid problems in analysis and, more important, to minimize the dilution factor. A composite consists of all food items within a class mixed together for analysis. Each class composite of food is examined at a much lower sensitivity level than that used for the samples described earlier. This lower sensitivity requires much more care during the analysis.

Each year a total of 30 diet samples are examined in 5 geographic regions, and 30 different cities are represented. A detailed evaluation report of data obtained through April 1966 is in manuscript for future publication. The data indicates that a well-balanced diet in the United States contains pesticide chemicals as follows:

chlorinated organic chemicals	—0.02 ppm
organic phosphate chemicals	—0.003 ppm
chlorophenoxy chemicals	—0.003 ppm
Carbamate chemicals	—0.05 ppm

The chlorinated organic chemicals are the most widely used and persistent pesticides. The kinds of specific chemicals and the relative amounts present are important because of wide variations in toxicity. DDT and its analogs, DDE and TDE, account for about three-fourths of the daily intake of chlorinated organic compounds at a total intake of 0.077 mg/day in the diet used in this study. Residues of dieldrin, lindane, and heptachlor epoxide follow in order of frequency. The six most commonly found residues account for 90 percent of the total intake. However, consumption of 4 kilograms (8.8 lbs.) of food a day is almost twice the consumption of 2.2 kilograms (4.8 lbs.) of food by the "average" individual. Therefore, the actual intake of pesticides in a well-balance diet will be substantially lower than those reported.

Acceptable daily intakes of specific pesticide chemicals in foods have been jointly proposed by the FAO of the United Nations and by the WHO Expert Committee. The following compares these levels with the findings calculated from the total diet samples:

	Acceptable Daily Intake (mg/kg body weight)	Calculated from Total Diet Samples
DDT	0.01	0.0005
Lindane	0.0125	0.00006
Malathion	0.02	0.009
Carbaryl	0.02	0.0012

Major components of the diet will affect the consumption of pesticide chemicals. For example, meat, fish, and poultry composites and dairy products composites, when combined, account for more than half of the intake of chlorinated pesticides. Most of the residues in these foods result from indirect additions through animal food, water, or other environmental factors.

Recently, a tolerance has been established for DDT and its analogs in dairy products, not because of direct application but because DDT is so widely distributed in the environment that it is impractical to prevent exposure of dairy animals to this chemical. It is well recognized that continuing use of other persistent pesticides will aggravate this situation. The uses of such chemicals are being critically examined to minimize or avoid such situations.

CONTINUED VIGILANCE URGED

From the above, we can conclude in general terms that currently the incidence and levels of pesticide residues in the Nation's food supply are not approaching dangerous or even alarming levels. The frequency and levels of residues in the Nation's food supply must not be permitted to increase unnecessarily. Additional measures are needed to avoid increases in specific food items where indirect sources result in residues; specifically, dairy products, eggs, and fish. Surveillance and control must continue at current levels to detect and eliminate problems arising from unexpected, unanticipated, and unavoidable sources, as well as from misuse. There are instances where residues remaining in the soil from previous crop treatment have migrated into subsequent crops. The usual degradation or disappearance of a chemical due to weathering may be delayed because of climatic conditions.

Improved analytical procedures may demonstrate conclusively the presence of a residue where, earlier, less sensitive procedures had failed. There are no "marker" foods that can be used as common denominators from which to judge the food supply as a whole.

The information on ready-to-eat foods obtained from the market survey is most reassuring, and supplements the interpretation of the data obtained on samples examined for compliance with tolerances. This kind of surveillance serves as a final check on the effectiveness of controls being exercised throughout the food production and distribution system.

In summary, there should not be alarm or complacency concerning pesticide residues in food. Continued responsible judgment and caution are required of those who use pesticide chemicals for whatever purpose. Additional research will provide better information concerning the total effect on man of environmental exposure to pesticide chemicals. Continued vigilance is required of those having the responsibility for the public's interest.

EMERGENCY FOOD PLANS

(Continued from Page 9)

the Order does provide for the regulation of food processing and distribution. For example, one section authorizes control of processor use of raw foods and ingredients. Thus, processors might be required to increase the ratio of product output to raw material input. This not only would boost food production, but would do so without equivalent increases in the use of fuel, electricity, water or other requisites which might be scarce. Similarly, limitations on product composition could help stretch scant supplies of critical foods.

A wide variety of actions might be taken to conserve inputs without depriving survivors of the food they need. Of primary importance is the continuation of the production and distribution of foods which are greatest in nutritive value, smallest in bulk, longest in storage life, and least demanding on non-food requisites.

The heart of the Order, so far as distribution is concerned, is regular resupply of retailers on a fair and equitable basis. Processors and wholesalers would be required to continue service to their regular customers; and the rate of distribution to them would be held to a specified percentage of their historical bases.

"Wholesomeness" is another area embraced by the Order. The food industry's customary responsibility, to supply only food fit for human consumption, may become more demanding if radioactivity introduces a new wholesomeness factor. Although it would be impossible to inspect all food shipped or sold, USDA could take appropriate action if food is found to be unfit for consumption from any cause.

Military needs would be provided for by requiring that existing contracts be completed; and that processors and wholesalers withhold for military procurement an historical percentage of their dollar volume of business.

In addition to the examples cited, the Food Management Order forms the basis for a wide range of requirements and limitations. However, the Order itself contains little regulatory machinery. Rather, it provides an authorizing framework on which necessary regulatory actions can be hung in the form of suborders designed to accomplish specific purposes.

An accompanying order, which is primarily procedural, affords an avenue for obtaining relief from unreasonable hardship resulting from compliance with any defense food orders.

The proposed standby defense food orders were developed as a part of USDA's regular defense preparedness activities which seek to anticipate and hopefully to alleviate the chaotic conditions which could result from a nuclear disaster.

REPORT OF COMMITTEE ON DAIRY FARM METHODS, 1966-1967

(Editor's note — Because of the length of the full report and the desirability of publishing the report in its entirety, publication will be in three sections. This is the first section. The second and third sections will follow in subsequent issues.)

This Committee for the past two years has consisted of 27 regular members, 11 state affiliate members and nine consultants. Most of the members and consultants have contributed to the preparation of the report.

The Committee operates under the leadership of a general chairman and two assistant general chairmen for the Eastern and Western areas and is made up of ten separate task or sub-committees headed by a chairman. Each task committee contains specialists in their line coming from different geographical areas in the country. In this manner each task committee report is representative of methods used all over the U. S. and Canada.

Names of the general chairmen, task committee chairmen, members and consultants will be given at the end of the full report.

Following are the reports of the separate task committees:

Antibiotics, Pesticides and Other Adulterants

Donald K. Summers, *Chairman*

Antibiotics

The problems of antibiotic residues in milk and milk products have been effectively reviewed by a great many authorities. It may be said, in general, that control practices have been effective with substantial reductions in milk rejections. Committee members report fair to excellent progress in antibiotic control programs; however, several conditions have recently occurred which demand that addition be directed to this problem.

The Federal Food and Drug Administration has announced to regulatory officials that they intend to tighten their regulations as applied to antibiotics, particularly to penicillin in fluid milk and manufactured dairy products.

FDA's new regulations are due, in part, to increased sensitivity by many persons to extremely small quantities of penicillin. In many instances the regulatory agencies have not adopted the use of the more sensitive test procedures to detect antibiotic contamination which are capable of determining antibiotic contamination at levels of 0.0005 units per milligram/or more. These are 10 to 12 times more sensitive than methods used by many milk control agencies. The majority of the control groups consider 0.05 units of penicillin per milligram as the permissible level in the milk supply.

Another important development is the distribution and sale of a number of antibiotics that specify a variation of milk withholding periods after injection of 36 hours to 108 hours. In view of the wide variation in the time intervals for milk to be withheld, it is most difficult for the dairyman and control agencies to supervise the acceptance and/or rejection of milk from treated cows. It was highly recommended that a standard milk withholding time be established for all antibiotics used in the treatment of dairy cows.

It is believed with increased attention directed to the control programs for abnormal milk, particularly mastitis, the use of antibiotics and other drugs will increase.

A number of recommendations are presented to aid in the elimination of antibiotics from the milk supply, as follows:

1. An intensive nationwide testing and educational program to demonstrate to dairymen the necessity of excluding antibiotic adulterated milk from the supply.
2. Limit the dose rate of intermuscular and intravenous injections to 100,000 units as now required for inter-mammary injections.
3. Require a prescription for the purchase of all penicillin and other antibiotics.
4. The use of dye-infusion antibiotics for intermammary treatment to assist in showing the presence of the drug remaining in the treated animal.
5. The development of more sensitive field and laboratory tests. It is the committee's recommendations that continued emphasis be applied to supervision and control of the antibiotic problem.

Pesticides

The use of pesticides in this country continues to increase at a rapid rate. Production of 800 million pounds of chemical pesticides in 1966 was at an all-time high.

It is readily apparent that effective control measures are necessary for the protection of the milk and other food supplies; however, it is equally important that realistic tolerances are necessary for a specific food. This committee as in the past, recommends that a permissible tolerance be set for milk and milk products, as opposed to the zero tolerance concept.

Following a review of the California petition by an advisory committee, it was established in March 1967, that a pesticide tolerance of 0.05 ppm for DDT, DDD, and DDE individually or in combination in milk and that food additive tolerances of 1.25 ppm on the milk-fat basis for residues in manufactured dairy products. In petitioning for the pesticide tolerances, it was emphasized that they did not seek deliberate use of these chemicals on dairy animals, in their feed, in the dairy barns, or in the milk houses. However, it is of common knowledge that amounts of these pesticides are unavoidably present in most milk supplies due to widespread pest control operations throughout the United States, necessitating an acceptable tolerance.

Cleaning of Farm Bulk Tanks and Transportation Tanks

Albert R. Pernice - *Chairman*

Additional studies and information is needed from the Task Committee members before a complete report can be presented.

C.I.P. Cleaning of Pipeline Milkers

William Pickavance - *Chairman*

This committee offers the following suggestions and recommendations as a result of studies over the past two years:

Many areas in the country are washing CIP pipelines for a period of 10 minutes instead of 20 minutes. Most areas in the country express satisfactory results and many area results are improved over the 10 minute wash in that the water temperature does not drop as far which reduces precipitation of minerals. The committee recommends that each producer should have his water supply tested and that a compatible detergent be used to maintain sanitary CIP cleaning of equipment.

The ten minute wash cycle is not a clear cut solution to every situation. It has been reported a few CIP pipelines have had to return to the 20 minute cycle. It is suggested that the manufacturer of detergents label the compound as to its critical temperature at the end point of the cleaning cycle.

We have found disagreement among committee members on the merits of pulsating inflations during the CIP washing period. Because of the disagreement it is recommended that additional research be conducted by at least three different groups under controlled conditions and materials and results be evaluated. Controlled conditions should include temperature, time and detergent solutions as well as procedures.

Some milking machine manufacturers have available an automatic acidifier for the automated washing devices where producers wish to use the acidified rinse. The automatic acidifier adds a pre-determined so many ppm of food grade approved acid depending on the water condition.

The use of acid is rather common and has given very successful results. Generally speaking, acid is used in the post rinse. In a few areas acid has been used in the pre-rinse with equally successful results. Many reports on the survey point out the film deposit has been eliminated completely or very much reduced. Also successful in eliminating or reducing the film are products with water conditioners in them when manufactured or added separately to the wash solution when the hardness of the water is known. Still another method is successful in aiding with the film problem. This method uses an acid type product and an alkaline product alternately.

When water is of zero hardness to a couple of grains the above named methods of film control are found not to be necessary.

The corrosion effect of the acidified rinse appears negligible. Usual concentrate is at a pH of 5.0 to 5.4 and this type of treatment appears to be of little concern to induce corrosion. The corrosive action appears only in a very few areas in the country where the water is a problem in itself and in cases where water contains chlorides. It is felt in these particular areas that the acid rinse may create problems.

The committee feels that this report is to be classified as recommendations only, and should remain as recommendations until findings are backed and proven by research on dairy farms. The majority of the committee feels the research should be done by university extension people with controls stipulated. We also feel that the research be conducted by at least three separate groups so that the results can be compared and finalized.

Education

Vernon D. Nickel - *Chairman*

The years 1966 and 1967 saw educational material which had previously been collected over a period of many months by hardworking members of the committee, abstracted by Wm. J. Dixon, Associate Editor of the Journal of Milk and Food Technology, and many of them published in the Journal during the years 1966 and 1967.

The Educational Committee is still in the process of gathering new material which it plans on forwarding to Mr. Dixon during the rest of 1967 and 1968.

Members of the Educational Committee have been requested to gather as much educational material on abnormal milk and its tests because this seems to be the topic of the day and the most sought after information.

PLASTICS

Bernard Saffian - *Chairman*

In the past few years, the use of plastics of many generic types have found their way into many applications on dairy farms. In 1965, a final report was submitted which covered recommendations for handling flexible lines.

During 1966-1967, a survey was made to cover all other applications of plastics on dairy farms. This survey named the application, the generic type of plastic and remarks concerning any problems arising in the use of the plastic in the specific application.

Forty-four applications for plastics on the farm were reported. Of these applications 13 were classified as being unsuccessful for one reason or another. In some cases, the types of plastic were not identified. It appears that where failures occurred, the choice of the proper plastic for the application was not made. It is conceivable that these failures could be corrected by better materials selection. (See Tables 1 and 2).

SEDIMENT IN FLUID MILK

Elmer Kihlstrum - *Chairman*

The approved methods for testing of milk are as outlined in Standard Methods for the Examination of Dairy Products. The USDA sediment test grading charts should be used for can and bulk tank milk. These charts are prepared by the U. S. Department of Agriculture in cooperation with the American Public Health Association and the Food and Drug Administration. Abnormal milk will frequently color the sediment test disk yellow and at times be shiny or show clots, shreads or flakes.

Milk produced under conditions which frequently or consistently permit the entrance of excessive quantities of extraneous matter reflects poor quality and is not in keeping with the way such a food should be handled. Such milk is a poor quality regardless of how low the bacteria count may be, or how low the temperature to which the milk may have been cooled.

RELATION OF DAIRY CATTLE HOUSING TO QUALITY MILK PRODUCTION

James Smathers - *Chairman*

In 1965, this subcommittee submitted a guideline report for "free-stall loose housing systems." We were instructed to continue our study, placing particular emphasis on problems and recommendations to the handling of manure in the fluid state.

Our subcommittee, by questionnaire, has assembled information from a large area of the country. Questions we believe to be pertinent and our current findings follow:

1. What are the most practical storage tanks with respect to shape and type of construction?

Rectangular or circular design with sufficient size or number for 15-gallon capacity per 1,000 to 1,400-pound cow per day of storage.

Watertight construction is recommended. Materials and design should be carefully engineered to withstand the pressures applied to walls, floor and cover. Tanks should be covered for safety and flood prevention.

Location planning is important for convenience to feedlot and housing areas. Tanks must be located downgrade from water supplies, with careful consideration given to protection of water supply potability. If located in a building, ventilation should be provided, with air passage from the building to the tank to outside air.

In the case of large dairy farm operations the construction of more than one tank is most practical.

2. What is the most practical storage capacity in number of days between emptying?

In special situations 30 to 60-day storage is recommended. Generally, however, in the northern climate and in areas of concentrated field cropping 90 to 180 days of storage capacity is recommended. Larger storage capacity assures the dairyman the advantage of spreading at the propitious time for minimum nutrient loss, most benefit to crops and favorable weather conditions.

3. What problems need to be solved with respect to fly breeding?

No particular problems have been reported with covered pits. Careful and practical sanitation management is necessary in operation of these systems to prevent accumulation on the surface in the vicinity of the system.

4. What is general practice with regard to added water?

General recommendation is to add 10 to 15% water to the volume. Drainage from the milking center is generally used. Precaution should be taken in construction to prevent surface water from flooding storage tanks during heavy rains. Controlled amounts of water may be added by proper management of downspouts on buildings. Eight to 10 inches of water should be placed in the bottom of the storage tank prior to filling with manure.

5. How often is agitation necessary?

General recommendation is to mechanically agitate to form a pumpable slurry just prior to emptying.

6. What are the problems in connection with frozen manure handling?

TABLE 1. PLASTICS TASK COMMITTEE SURVEY ON PLASTICS APPLICATIONS ON FARMS MADE DURING 1966-1967

Product	Type of Plastic	Remarks and Suggestions for Improvement
Rigid pipelines	Polycarbonate	High degree of expansion with temperature variation
Dairy Brushes	Nylon	Good cleaning job
	Alginate	Maximum use temperature is 130 F, and will not resist acid
	Polypropylene	Good — resists acid and hot water — gives long life
Wash basin, hand	Alginate	Poor — short life
Washing pail	Alginate	Fair — light in weight — does not mar stainless steel equipment when in contact
Ball check valve for dumping station	Rigid PVC	OK
Stall cocks	Rigid PVC	OK
Water lines	Rigid PVC	OK — in cold climate may freeze and be difficult to thaw unless a single heavy wire is placed in tube at time of installation.
Filter pad boxes	?	Fair — some have been broken apparently due to rough handling
Transfer hose from tank to truck	Flexible PVC	OK
Manhole cover on tank truck	?	Much breakage
Cover for milk carrying pail & strainer	?	Unsatisfactory
Gaskets	Fluorocarbon	?
Air cocks on vacuum lines	?	Not too good
Unions and elbows	Rigid PVC (?)	?
Milk meters	?	Air leaks, non-CIP
Claw parts	Rigid PVC	?
Shut off stem in milking head	?	Rough edges
Pipe line milker - milk receiver bowl	?	Scratch easily — numerous fractures
Black vacuum line	Flexible PVC	OK

TABLE 2. PLASTICS TASK COMMITTEE SURVEY ON PLASTICS APPLICATIONS ON FARMS MADE DURING 1966-1967

Product	Type of Plastic	Remarks and Suggestions for Improvement
Valve outlet cap on pipeline milker	?	?
O-rings	?	?
Hose	Nylon	?
	Fluorocarbon	?
Bulk tank manhole cover	Acrylic	?
Milking Machine sight glass	?	Poor cleaning around gaskets
Filter holder	Polycarbonate	?
Pipeline inlet valve	?	?
Teat cup shells	?	?
Vacuum regulator	Fluorocarbon	OK
Pipeline couplings	?	Couplings loosen and crack
CIP teat cup washer	?	Crazing occurs
Pulsator body and valve	Fluorocarbon	Lubrication
Pipeline hangar clamps	?	?
Float valve	?	Cracking
Milk weighing device	Polycarbonate	?
Rigid vacuum lines	?	?
Milk pump impellers	?	?
Moisture traps	?	?
Milk line	Polyethylene	Must be taken apart for inspection
Cleaning proportioning devices and chlorinators	Acrylic, Acetal, Chlorinated Polyethylene	?
Milk sample containers (bottles, Pipettes, bags)	?	?
Air lines	?	?
Hose connections for automatic bulk tank cleaning	?	?
Inflation shells	Polycarbonate	?
Milker unit	Polycarbonate	?

Tanks should be constructed underground to prevent freezing. Frozen material should not be added. In some areas it is necessary to use conventional spreading equipment for handling manure during periods of extreme freezing conditions.

7. What are the new developments in farm machinery to handle fluid manure?

In general use are vacuum systems and pump systems. Augurs and pumps are often used for agitation. Floor sumps or screening devices should be used to prevent solid material damage to equipment. Field spreaders and tanks should be watertight. It is recommended that they be equipped with flotation-type tires to prevent ground impaction. In some areas the use of improved irrigation pumping systems are being employed.

8. To what extent are objectional odors prevalent?

Strong, vile odors are present during agitation and spreading. In some locations this problem is pointed up through pending lawsuits.

Some work is being done in the mid-West where an ozone chemical compound is added to the liquid manure tank daily through water from the milking center. In cold weather this practice has eliminated odor when agitating. Further studies will be conducted during warm weather for this type of odor control.

Since cleaning and spreading are generally done at different times than milking, we have no reports of milk flavor and odor problems.

9. What crop production advantages or disadvantages are evident from the use of fluid manure as fertilizer?

Conclusive research data are not available to date. Field studies in Vermont indicate that of 36 slurry samples of dry matter analyzed for chemical content, nitrogen content averaged 1.8%, phosphorus 0.6% and potassium 2.7%. On these samples total solids were in a range of 8 to 11%, averaging 9.2%. This data agrees with the thinking of some that manure, as such, does not compare favorably to the value of commercial fertilizers.

Estimates of fluid manure users are that higher yields are obtainable on most field crops. Burning of small grains and pasture and hay crops is evident, however, if applied at a wrong stage of development.

10. What economy, if any, is involved for the dairyman through his investment?

This system adds materially to the producer's dairy farm investment. Depending upon storage capacity, construction costs range from $40.00 to $100.00 per cow. Short storage capacity tends to defeat the purpose of the system. The biggest advantage for the system is having a convenient place to store manure and consequently having some control over the disposal schedule. Some users claim more economical distribution of labor, but to date no data are available on actual labor cost reduction. This system eliminates the necessity for manure piling and improves general sanitary conditions. Apparently, economic value must be proved by better crop yields.

Suggested guidelines are available for Sanitarians' use in most parts of the country. We list a few publications believed to be helpful in the design, construction and operation of this system:

"Handling Manure as a Fluid," prepared by the Northeast Loose Housing Subcommittee. Available New York State Cooperative Extension Service, Department of Dairy and Food Science, Dept. 118, Stocking Hall, Ithaca, New York.

"Liquid Manure Handling for Dairy Cattle," prepared by Pennsylvania Dairy Sanitarians Association, Pennsylvania Department of Agriculture, Agriculture Extension and Dairy Extension Staff, Pennsylvania State University, Available at Pennsylvania State University College of Agriculture, University Park, Pennsylvania 16802.

"Liquid Manure Handling for Dairy Cattle." These are recommended guidelines. Supplement to Dairy Cattle Housing Guidelines for Wisconsin. Copies are available from the Agricultural Engineering Department, University of Wisconsin, Madison, Wisconsin.

"Liquid Handling of Dairy Manure," by L. Bynum Griggers. Available at ME-33 Agricultural Extension Service, V.P.I., Blacksburg, Virginia.

"An Introduction to Handling Liquid Manure," Agricultural Engineers' Digest, published by 1966 Midwest Plan Service, Ames, Iowa.

"Cattle Manure Handling and Disposal," EM 2416, June 1964, by Agricultural Extension Service, Washington State University, Pullman, Washington.

CEREAL CHEMISTS SCHEDULE SECTIONAL MEETING

The Central States Section of the American Association of Cereal Chemists will sponsor their Ninth Annual Symposium on February 16 and 17, 1968 in St. Louis, Missouri. Title of the 1968 Symposium is "Infestation and Microbiological Control of Cereals and Cereal Products."

This Symposium will be of interest to a large number of people in the food and food ingredient manufacturing fields. Those interested in attending this Symposium should contact Mr. Thomas Kichline, Monsanto Company, 800 North Lindbergh, St. Louis, Missouri 63166.

COMBATTING MILKSTONE ON DAIRY FARM EQUIPMENT

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Long Island City, N. Y.

(Received for publication August 28, 1967)

In spite of improved knowledge and superior detergent formulations, milkstone formation continues to present a problem, especially in hard water areas. Alternating acid and alkaline detergents was recommended, but this had its drawbacks. Next, acidifying the clear water rinse following the detergent wash was recommended as being simpler and just as effective. Finally we had the idophors, "tamed iodine" products, which were shown to be effective both as detergents and as sanitizers. These combined detergency with an acid reaction, and also stained milkstone and protein films, providing convincing evidence that the surface was not clean. However, milkstone can occasionally be found on farms where they claim to be using an iodine complex, although this is very rarely true if a good product is used according to the manufacturer's directions.

It seems possible that a slight change in cleaning procedure could be helpful in further reducing the possibilities for milkstone formation. While holidaying in Australia and New Zealand last winter (1966-67) (during their summer) the author found both research workers and control officials strongly recommending the use of 0.03% of a suitable wetting agent (non-ionic) in the initial rinse immediately after milking. This practice is quite widely followed in those countries, with very favorable results. (Incidentally, the advantages of using a wetting agent in the initial rinse were stressed by Levowitz *(1)* in 1958!)

The origin of this practice is reported in the November-December, 1965 issue of the *Dairy Farming Digest* published by the Victorian (Australia) Department of Agriculture. Mr. J. W. Masters, a dairy supervisor for that Department, noticed that when he rinsed a glass pipette first in water containing a wetting agent, it cleaned much more easily in the usual hot alkaline solution. He realized that the addition of a wetting agent to the rinse water run through a milking machine to remove residual milk would be similarly advantageous, and suggested that this be tried. Slide holders containing clean glass slides were fitted to the dropper tubes of pipeline milkers to compare the effectiveness of cleaning with and without a wetting agent in the first rinse *(2)*.

The first results were not impressive. After a period, milkstone had built up to about the same extent on the two sets of slides. Later, a "milking simulator" *(3)* set up at Hawkesbury Agricultural College by the New South Wales Department of Agriculture to carry out accelerated tests of detergents and cleaning systems, made more extensive tests possible. This device automatically follows a cycle of running milk through the system for the duration of a normal milking, followed by the circulation of the cleaning fluids, air drying, then repetition of the cycle, so that in less than two days it has done the equivalent of a month's milking and cleaning on the dairy farm.

Mr. Alan Twomey, who made the tests using the simulator, found that the method is highly effective only when certain non-ionic wetting agents are used. When the author visited the Ruakura Agricultural Research Centre of the New Zealand Department of Agriculture, Mr. Twomey, who is now working there with Dr. W. G. Whittlestone, the well-known authority on mechanical milking, showed him some of the results he had obtained there with an improved model of the "milking simulator." Without question this practice of using a non-ionic wetting agent in the initial rinse is decidedly worth while, especially in hard water areas. However, this alone may not entirely prevent milkstone formation. Twomey reports that if the milk-handling equipment also receives a sanitizing rinse with a good iodine product (iodophor) before every milking, no milkstone buildup occurs, and it is not necessary to resort to a special weekly treatment with an acid detergent. Incidentally, the iodophor sanitizing rinse for milking equipment is now strongly recommended by the dairy divisions of the Departments of Agriculture in each of the Australian states and in New Zealand, along with the non-ionic solution pre-rinse, as experience on hundreds of farms in each area has amply demonstrated the value of both these steps in keeping milking equipment cleaner.

One possible objection to the recommendation of a non-ionic rinse is that it means introducing yet another type of product. Many sanitarians and fieldmen feel there are too many products in most milkhouses already, and that the producer is often confused about their uses. To avoid this, it occurred to the author that a similar advantage could be obtained by having the producer save the iodophor

solution used for sanitizing his equipment, and run this through in place of clear water for the initial rinse. Such a sanitizing solution contains an appreciable amount of a *suitable* non-ionic wetting agent, along with sufficient acid to prevent the deposition of minerals from hard water and milk. It should thus be very helpful in keeping equipment cleaner. When this practice was suggested to Mr. E. I. Carter, Dairy Advisor in the Queensland Department of Primary Industries, he indicated that it was already being done by farmers in his area. Perhaps we in North America could take a leaf out of their book!

Where the volume of used sanitizing rinse is inadequate, the required additional volume may be made up by adding 1 oz of iodine detergent-germicide to each 20 gal (U.S.) of 110 F water. Again, with very hard water, the addition of 1 oz of iodine detergent-germicide to each 20 gal of rinse water following the detergent solution will prevent the deposition of hard water salts on milk-contacting surfaces.

REFERENCES

1. Levowitz, D. 1958. Raw milk of low total and thermoduric count. Am. Milk Rev. 20:(3), 62-72.

2. Whittlestone, W. G. 1964. The principles of mechanical milking. New South Wales Milk Board, Sydney, Australia, p. 5, 6.

3. Whittlestone, W. G. and A. Twomey. 1966. New testing system for dairy detergents will bring protection to farmer. N.Z. J. Agr. 112:(2), 50-55.

ASSOCIATION AFFAIRS

ANNOUNCEMENT CONCERNING THE SANITARIANS AWARD FOR 1968

Announcement is made that nominations will be accepted for the annual Sanitarians Award until June 1, 1968, and the members of the International Association of Milk, Food and Environmental Sanitarians, Inc. are requested to give consideration to the nomination of individuals whose professional work in the field of milk, food, or environmental sanitation in their communities has been outstanding.

The Award consists of a Certificate of Citation and $1,000 in cash, and is sponsored jointly by the Diversey Corporation, Klenzade Products, Inc., and Pennsalt Chemical Corporation. It is administered by the International Association of Milk, Food and Environmental Sanitarians, Inc., and is presented annually. The next presentation of the Sanitarians Award will be made at the 55th annual meeting of the Association which is to be held at St. Louis, Missouri, in August 19-22, 1968.

The Executive Board of the Association has established the following rules and procedures governing the Sanitarians Award.

Eligibility:

1. *General Criteria*

To be eligible for nomination the Sanitarians Award offered annually by the International Association of Milk, Food and Environmental Sanitarians, candidates must:

a. Have been a member of IAMFES in good standing for a period of five years prior to the date when the Award is to be presented;

b. Be a living citizen of the United States or Canada who, at the time of nomination, is employed as a professional sanitarian in the field of milk, food, and/or environmental sanitation by a county or municipality; provided that any sanitarian employed by a higher political subdivision, up to and including a State, who works in a capacity and is assigned duties comparable in scope and responsibility to those normally expected of county or municipal sanitarians, shall also be deemed eligible to receive this Award.

Members of the Executive Board, members of the Committee on Recognition and Awards of the International Association of Milk, Food, and Environmental Sanitarians, employees of Federal and State agencies (except as provided above), and industry members shall not be eligible for the Award. Race, sex or age shall not enter into the selection of the Award recipient.

c. Have made a meritorious contribution in the field of milk, food or environmental sanitation, to the public health and welfare of a county, counties, district or municipality within the United States or Canada.

d. Have completed the achievements and contributions on which the nomination is based during the seven-year period immediately pre-

ceding January 1, of the year in which the Award is to be made.

2. *Additional Criteria*
   a. Co-workers are eligible for nominations if both have contributed equally to the work on which the nomination is based and each independently meets the other qualifications for nomination.
   b. Where co-workers are selected to receive the Award, each shall receive a certificate and share equally in the cash accompanying the Award.
   c. No person who has received, or shared in receipt of the Award, shall be eligible for renomination for this Award.

Nominations

Nominations of candidates for the Sanitarians Award may be submitted by the Affiliate Associations of the IAMFES, or by any member of the Association in good standing except members of the Executive Board, members of the Committee on Recognition and Awards, and employees of the sponsoring companies. Nominations from persons who are not members of the Association cannot be accepted. No member or Affiliate may nominate more than one candidate in any given year.

Each nomination must be accompanied by factual information concerning the candidate, a resume of his work and achievements, evidence supporting his achievements and if available, reprints of publications. A form for the submission of nominations may be obtained upon request from H. L. Thomasson, Executive Secretary, International Association of Milk, Food and Environmental Sanitarians, Inc., P. O. Box 437, Shelbyville, Indiana 46176.

Submission of Nominations

The deadline for submission of nominations is set annually, and all nominations and supporting evidence must be postmarked prior to midnight of that date. The deadline this year is June 1, 1968. Nominations should be submitted to Mr. Fred E. Uetz, Senior Past President, Chairman, Committee on Recognition and Awards.

The Committee on Recognition and Awards of the International Association of Milk, Food and Environmental Sanitarians, Inc., has full responsibility for selecting from among the candidates nominated the recipient of the Sanitarians Award. In judging the contributions of each candidate, the Committee will give special consideration to (*a*) originality of thought, mode of planning, and techniques employed, (*b*) the comprehensive nature of the candidate's achievements, and (*c*) their relative value as they affect the health and welfare of the candidate's community. The Committee will give consideration also to the efforts of the candidate to establish professional recognition in the community in which he serves, as well as to his research, administrative development, program operation and educational achievements. Additional information or verification of submitted information will be requested when considered necessary by the Committee. Testimonial letters in behalf of a candidate are not desired.

If after reviewing the nominations and supporting evidence, the Committee decides that the work and achievements of none of the candidates have been significantly outstanding, the Award shall not be made. In this connection, it is fundamental that if meritorious professional achievement cannot be discerned the Award shall be omitted for a year rather than to lower the standards for selections of a recipient.

IAMFES CITATION AWARD

Awards Committee would also appreciate receiving nominations for the Citation Award for consideration of the Executive Board.

Fred E. Uetz, Senior Past President,
Chairman, Committee on Recognition and Awards, 395 Maitland Avenue, West Englewood, New Jersey 07666.

PAPERS PRESENTED AT RECENT AFFILIATE ASSOCIATION MEETINGS

Editorial Note: The following is a listing of subjects presented at recent meetings of Affiliate Associations. Copies of papers presented may be available through the Secretary of the respective Affiliate Association.

WISCONSIN ASSOCIATION OF MILK AND FOOD SANITARIANS

23rd Annual Meeting
Madison, Wisconsin
September 14-15, 1967

(In cooperation with the Wisconsin Dairy Plant Fieldmen's Association)
(*Secretary,* L. Wayne Brown, 4702 University Ave., Madison, Wis. 57305)
Water Pollution and Waste Disposal—*Freeman Holmer*
Our Public Image—*W. J. Cole*

New Developments in Detergents—*Robert Barrett*
The Grade A Program Today—*W. R. McLean*
Communication—*Charles Arps*
Changes in Agricultural Extension—*Henry Ahlgren*

NEW YORK STATE ASSOCIATION OF MILK AND FOOD SANITARIANS

44th Annual Conference
Buffalo, New York
September 18-20, 1967

(Sponsored jointly with Cornell University Food Science Department.)
(*Secretary,* R. P. March, 118 Stocking Hall, Cornell University, Ithaca, N. Y.)
Feeding the Hungry World—Some Challenges—*K. L. Turk*
Laboratory Control of Single Service Containers—*R. T. Russell*
The Detection of Salmonella—*Mrs. M. M. Galton*
Laboratory Methods for Testing Effluents in Dairy and Food Plants—*N. C. Dondero*
Discussion of the New 12th Edition of "Standard Methods"—*A. R. Brazis*
Newer Food Processing Methods and Microbial Safety—*N. N. Potter*
Recent Progress in Prevention of Foodborne Diseases—*K. H. Lewis*
Inter and Intra-agency Duplication of Inspections—An Unfortunate Waste—*N. W. Bartz*
Technical Resources Program—*R. I. Lachman*
Environmental Health Technology at Broome Technical Community College—*D. F. Newton*
Practical Aspects of Making Food Protection Work—*V. E. Cordell*
The Relationship of FDA with other Official Agencies—*W. L. Clevenger*
New York State Food Service Training Program—*A. E. Abrahamson*
Farm Practices Subcommittee Report—Uniform Industry Farm Score Sheet—*D. H. Race*
Cross-connection and Submerged Inlets as Applicable to the Dairy Industry—*R. W. Wilson*
Status of New York State's Adoption of USPHS Milk Ordinance—*C. H. Colvin*
New York City and the USPHS Milk Ordinance Adoption Study—*W. H. Grunge*
From Donkey Carts to Bulk Tankers on the Shamrock Isle—*R. P. March*
Recent Developments in Milk Marketing—*A. R. Place*
Cleaners and Sanitizers—How to Use Them—*G. H. Watrous, Jr.*
Tri-State Milk Flavor Program—*D. K. Bandler*
Elimination and Measurement of Excess Water in Milk—*W. F. Shipe* and *J. C. White*
Liquid Manure Handling—Fall 1967—*G. C. Perry*
Problems in Bulk Milk Handling—*S. Steinberg* and *J. H. Worley*
3-A Sanitary Standards Changes for H.T.S.T. and Others—*W. K. Jordan*
Updating Cleaning and Sanitation for Milk Plants—*G. A. Smith*
Dry Milk Equipment Design in Relation to the Salmonella Problem—*R. G. Semerad*

INDIANA ASSOCIATION OF SANITARIANS

17th Annual Meeting
Indianapolis, Indiana
September 26-28, 1967

(*Secretary,* John D. Boruff, R. R. 1, Roachdale, Ind.)
The Sanitarians' Future—*A. C. Offutt*
Panel: Pollution and Adulteration of Our Environmental Resources—*Samuel Hopper, Acord Cantwell, T. C. Maraviglia, W. J. Corbett, M. D. High, Seigel Osborn,* and *John Janson*
Panel: Administration and Management of Public Health Department Programs—*D. D. Gowings, James McCoy, John Fancher, Robert Yoho* and *H. S. Adams*
The Role of Publicity in a Public Health Campaign—*L. E. Englehart*

WASHINGTON MILK SANITARIANS ASSOCIATION

Annual Meeting
Seattle, Washington
September 29, 1967

(*Secretary,* Ben Luce, P. O. Box 1122, Olympia, Wash. 98501)
Freeze Drying of Food—*John Barnhart*
Space Age Sanitation—*John Barnhart*

CALIFORNIA ASSOCIATION OF DAIRY AND MILK SANITARIANS

49th Annual Meeting
Sacramento, California
October 2-4, 1967

(*Secretary,* Kenneth Hayes, 6520 Steiner Drive, Sacramento, Calif.)
California Agricultural Problems—*Allen Grant*
Fly Control on Dairy Farms—*Larry Jackson*
Facts and Fantasies in Merchandising Dairy Products—*Leonard Flint, Jr.*
Coliform Versus Sediment Testing in Raw Milk—*C. K. Johns*
Psychrophilic Bacteria in Pasteurized Milk—*Lloyd Henderson*
Fundamentals of Cleaning and Sanitizing Farm Milk Equipment—*C. K. Johns*
Salmonella in Dairy Products—*G. K. York*
Dairy Waste Disposal—*G. K. York*
Milk Equipment and Its Relationship to Milk Quality—*Glenn Goble*
Mastitis and Its Relation to Bacterial Quality in Milk—*R. B. Bushnell*
Current Problems in Producing High Quality Milk—*W. R. Thomas*

C. B. SHOGREN MEMORIAL FUND DISPOSITION

Shortly after the death of C. B. Shogren, Honorary Life Member, in December, 1965, a number of contributions were offered to establish a C. B. Shogren Memorial Fund to be used at the discretion and disposition of the Executive Board of IAMFES in the interest of promoting the education and professional development of the Sanitarian. C. B. Shogren, co-founder and president of Klenzade Products of Beloit,

Wisconsin, and a long time member of the Association, had always given active support to the efforts of the Association in improving the welfare and professional status of the Sanitarian.

The Fund, ultimately reaching a total approximating $900, has been on deposit with other cash reserves of the Association pending the decision of the Board as to its use. Consideration has been given to utilizing it for various purposes including an award of merit, establishment of a reference library for sanitarians, and publication of brochures and other educational material.

At its 1967 meeting at Miami Beach August 13-17, the Executive Board voted to utilize the C. B. Shogren Memorial Fund for the purpose of publication and distribution of educational material for the sanitarian developed by the various technical committees of the Association.

ONTARIO SANITARIANS HOLD SYMPOSIUM ON SALMONELLA PROBLEMS

The Ontario Milk Sanitarians' Association sponsored a one-day symposium on Salmonella on November 29, 1967, at the University of Guelph. The title of the symposium was "A Look at the Salmonella Problem".

Topics discussed included the following: Public Health Significance of Salmonella; A Report of an Outbreak of Salmonellosis in Cattle in Manitoba; What do Salmonellae Need for Growth and Survival?; Sources of Salmonellae Entering the Plant; How Salmonellae may Contaminate Products Within the Plant; Role of Management in Control of Salmonellae; and the Incidence of Salmonellae in Dairy Food Tested under the F.D.D. Surveillance Program.

Discussions were led by members of the staff of the University and representatives of industry in Ontario. Dr. A. N. Myhr, Chairman of the Department of Dairy Science, presided at the meeting.

Dr. Myhr is currently President of IAMFES.

REPORT OF THE COMMITTEE ON ENVIRONMENTAL HEALTH

Paris B. Boles, *Chairman*

The Committee on Environmental Health was founded in March 1967. Much interest is being expressed in New Environmental Health Programs and the Committee is recommending the following programs be given priority: (1) Liquid Waste; (2) Hospital Sanitation; (3) Air Pollution; and (4) Solid Waste.

The Hospital Sanitation Sub-committee has been organized under the guidance of Mr. David S. Reid of the National Institute of Health. Plans are under way to form other subcommittees related to Environmental Health Problems.

Following is the first report of the Sub-committee on Hospital Sanitation prepared by Mr. Reid:

Dr. P. R. Elliker, President, IAMFES, in June, 1967, authorized the formation of a Hospital Sanitation Subcommittee of the Committee on Environmental Health Programs. Upon receipt of Dr. Elliker's authorization, the new chairman sent letters to each of the twenty-six state affiliates of the IAMFES soliciting replies from sanitarians desiring to serve on the Subcommittee. Sufficient time has not elapsed to permit a full response.

A criterion of the extent of interest in the hospital environment today is the large number of articles and publications in circulation. Most of the work represents individual points of view which may or may not be acceptable to the majority of professionals actively engaged in hospital sanitation practice. Committee reports have appeared from one or two professional organizations similar to our own. These have, in the main, dealt with specific problems and suggestions for correction. As would be expected from dealing with a subject as vast as the hospital environment, reports published to date represent only acknowledgement that a problem exists.

To one familiar with the environmental health problems of the hospital and related health care facilities, what has been done is dwarfed by what remains undone.

Areas Needing Immediate Attention

If the sanitarian is to be effective in hospital sanitation work he must be given guidelines for dealing with problems relating to:

1. Defining "clean" hospital environment.
2. Developing expertise in operational aspects of institutional cleaning.
3. Evaluating cleaning supplies and equipment.
4. Monitoring of the hospital environment.
5. Standardizing inspection procedures and reporting forms used at local, state, and federal levels.
6. Defining the role of institutional sanitarian.

Hospital sanitarians with a leaning toward administrative aspects of hospital work should be made aware that a little additional training would admirably equip them for other hospital positions. An illustration of the latter positions is that of infection control officer or hospital administrator. In considering the training of sanitarians, the Subcommittee might wish to make recommendations relative to undergraduate and graduate curricula and achievement of a desirable balance between theoretical and practical education. It is believed that the present system of on-the-job training for acquiring skills for coping with problems of the hospital environment is long, tedious, and expensive.

Membership Composition and Work of the Subcommittee

Discussions should first center about the role to be played by the Association in the institutional field. Once this has been done, the scope of the Subcommittee's activities should be defined, priorities set, and guidelines developed for accomplishing the objectives. The Subcommittee's ability to masterfully deal with the entire spectrum of hospital environmental health problems will depend on the extent to which the individual members are qualified in specialties such as industrial hygiene and safety, radiological health and safety, microbiology, chemistry, engineering, training, general sanitation, and institutional sanitation.

If the membership is not sufficiently well-versed for the

whole problem, it would seem wise to consider initially only those parts about which it may speak authoritatively. Later, as the Subcommittee gained recognition and additional specialists, it could enlarge its role.

Members of the Association desiring to affiliate with this Subcommittee should contact Mr. David S. Reid, 6711 Danforth Street, McLean, Virginia, 22101.

MEMBERSHIP OF
COMMITTEE ON ENVIROMENTAL HEALTH

P. B. Boles, *Chairman*, Monticello, Ky.
R. L. Cooper, *Co-chairman*, Murray, Ky.
Richard Bond, Minneapolis, Minn.
Richard Clapp, Atlanta, Ga.
Cameron Adams, Olympia, Wash.
James Barringer, Joliet, Ill.
A. L. Klatte, Indianapolis, Ind.
Maxwell Wilcomb, Norman, Okla.
D. S. Reid, Bethesda, Md.
Ray Belknap, Cincinnati, Ohio

KANSAS AFFILIATE TO CHANGE ITS NAME

The Kansas Association of Public Health Sanitarians met in their annual conference on November 1, 2, 3, 1967, at the Broadview Hotel, Wichita, Kansas. The officers for the coming year are as follows: C. H. Corwin, President; Keith Nash, 1st Vice President; Dennis Foster, 2nd Vice President; and John W. Zook, Secretary-Treasurer.

At this annual conference, a new constitution was submitted to the members for approval or rejection. The proposed change was adopted by a two to one majority. The new constitution does not go into effect until the annual meeting in the fall of 1968. The name of our association will then be "Kansas Association of Environmentalists." The main purpose of the constitutional changes was to make a place in our organization for people in housing and trades areas, representatives from: Urban Renewal Agencies, Housing Code Enforcement, Planning Agencies, Community Action Programs, Local Housing Authorities, and Building Inspection Departments.

NEWS AND EVENTS

PENNSALT NAMES JAMES FIKE DISTRIBUTOR SALES MANAGER

James E. Fike, formerly market manager of the Pennswim Department, has been named Manager of Sales—Distributor Sales Department of the Pennsalt Chemicals Corporation.

In his new position, Fike assumes overall responsibility for distributors handling Pennsalt's complete line of B-K and other cleaners and sanitizers for the dairy and food industry, Pennswim swimming pool chemicals, and Tyme automotive products.

Fike holds a bachelor's degree from West Virginia University and a master of science in dairy technology from the University of Maryland. He joined Pennsalt in 1956 as an engineer in the Technical Service Department, and transferred in 1959 to the Dairy and Food Department. More recently he headed the Pennswim Sales Department.

Jim is a member of IAMFES. Pennsalt is one of the companies sponsoring the annual Sanitarian's Award and on numerous occasions Jim has represented his firm at the Sponsors Table at the Annual Banquet.

NEW EXHIBIT TELLS CONSUMERS ABOUT GRADES FOR FOOD

"USDA Grades—To Help You Choose," a new U. S. Department of Agriculture exhibit designed to tell the food shopper how to make use of USDA grades in buying food, had its premier showings this fall at two expositions. Large crowds at both the World Food Exposition, in Madison, Wisc., September 15-24, and the Pan-American Food Exposition, in Miami, Fla., October 25-27, visited the exhibit displayed by USDA's Consumer and Marketing Service.

The 20-foot exhibit features audience participation. It permits the visitor to test his knowledge of the USDA grade marks for food, obtain tips on how to buy various foods, and get a recorded message on what the USDA grades mean, who can use them, and where they can be found.

Also explained in one section of the exhibit is the difference between the round USDA inspection marks, which assure the wholesomeness of meat and poultry, and the shield-shaped USDA grade marks, which are guides to food quality.

Five panels in the exhibit give "how to buy" information, at the push of a button, on poultry, eggs, fruits and vegetables, dairy products, and meat. Brochures containing the same and additional information are distributed to exhibit visitors.

Also part of the exhibit is a revolving pylon displaying lighted color transparencies of various foods bearing the USDA grade marks. At the base of the pylon are earphones through which visitors can get a recorded message on how USDA grades can "help you choose."

The exhibit is available for display at National and State meetings, fairs, and similar events through the Exhibit Service, Office of Information, U. S. Department of Agriculture, Washington, D. C. 20250.

DR. LISKA HEADS NEW FOOD SCIENCE INSTITUTE AT PURDUE

Establishment of a Food Sciences Institute to provide scientific leadership and coordinated management for interdisciplinary research, educational and extension programs in food sciences has been authorized by Purdue University's board of trustees. Announcement of the administrative unit involving the schools of agriculture, home economics and veterinary science and medicine was contained in an Executive Memorandum from Purdue's president, Dr. Frederick L. Hovde.

Dr. Bernard J. Liska, professor of food sciences in the Department of Animal Sciences, was named director of the Institute. A Purdue staff member since 1959, Liska holds the B.S., M.S. and Ph.D. degrees in dairy and food science from the University of Wisconsin. He is a member of numerous professional associations and the author of some 75 publications in the foods area.

The newly estalished Food Sciences Institute will coordinate development and supervision of undergraduate and graduate teaching programs, stimulate and coordinate new or expanded research and extension programs, assist staff members in broadening the base of research support in food sciences and serve as the central vehicle of communication at Purdue for students, staff, industry and government agencies with an interest in food sciences and related areas.

Named to a policy committee which will make administrative and management decisions for the Institute were Liska, Dr. F. N. Andrews, vice-president for research; Dr. Earl L. Butz, dean of agriculture; Dr. Eva L. Goble, dean of home economics; Dr. E. V. Morse, dean of the school of veterinary science and medicine, and Dr. H. H. Kramer, director of the agricultural experiment station. Liska will serve as committee chairman.

Thirty-one staff members were named by President Hovde to the Institute. They represent the Departments of Animal Sciences, Biochemistry, Agricultural Engineering, Biological Sciences, Agricultural Economics, Foods and Nutrition, Horticulture and Veterinary Science.

Dean Butz pointed out that the establishment of the Institute "underlines the growing importance of this area of training and research at Purdue and in Indiana." He added that "a cadre of well trained and highly motivated scientists is working in food sciences, and that some 30 graduate students and about an equal number of undergraduate students are majoring in some phase of food sciences."

"Formation of the Food Sciences Institute will identify this group of scientists," Butz asserted, "and will form the base for expansion of this important area of training and service for our state and nation."

UNIVERSITY OF CONNECTICUT TOP TEAM IN DFISA DAIRY PRODUCTS JUDGING

The University of Connecticut judging team walked off with the top award of the 33rd Collegiate Students' International Contest in Judging Dairy Products—a $2,500 cash fellowship and accompanying All Products Bowl. Connecticut's 3-man team also cap-

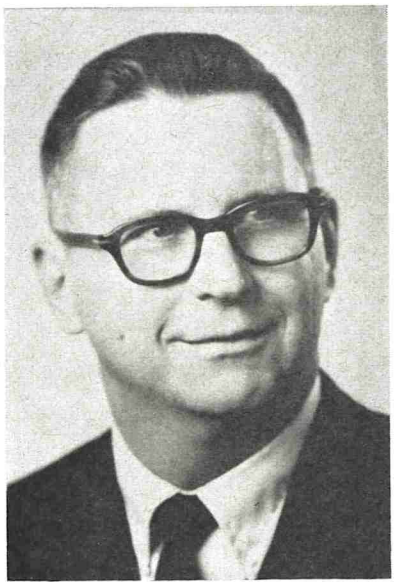
tured the second place butter award and third place ice cream prize—both of which are trophy case plaques.

Second-ranking team in All Products judging—which rates overall ability to test milk, ice cream, cottage cheese, butter and cheddar cheese, was the one from the University of Illinois. The University of Minnesota team placed third and received a $2,200 cash fellowship and plaque.

Some 46 awards were presented at the All Industry Banquet honoring contest participants, held October 24, 1967 at the meeting of the Dairy and Food Industries Supply Association in Los Angeles, California. Teams received cups and fellowships for their judging performances, while outstanding individuals in each product division were awarded gold wrist watches, silver medal and bronze medal desk sets for first, second, and third places, respectively.

The Contest is an annual event which invites colleges and universities throughout the United States and Canada to enter student teams to compete in judging five dairy products according to appearance, odor, touch and taste. Students' ratings are then compared against the standards set by professional judges.

R. J. STUCKY NAMED TECHNICAL SALES MANAGER FOR SEP-KO



Everett Wostrel, General Manager of Sep-Ko Chemicals, Inc. of Minneapolis, manufacturers of cleaners and sanitizers for the dairy and food industries has announced the appointment of R. J. (Dick) Stucky head of the company's Technical Sales Division.

Stucky's responsibility will also include the Farm Service Department. He will work closely with Sep-Ko representatives in the field and quality control personnel in the plant.

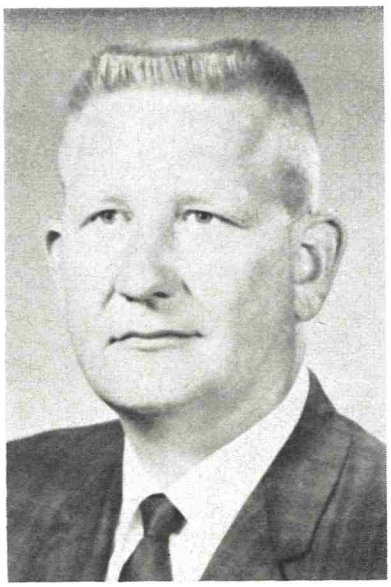
Stucky has a broad background in management, production and marketing in the dairy industry. He is a graduate of the University of Minnesota with a B. S. degree in Dairy Science.

JOHN MURRAY TO ADVANCED INSTRUMENTS SALES STAFF

Advanced Instruments, Inc., manufacturers of the Milk Cryoscope and other laboratory and clinical equipment has announced the addition of Mr. John R. Murray to the Company's sales staff. Mr. Murray's addition was necessitated in order to meet the growing sales and service requirements of this rapidly expanding manufacturer.

Murray has extensive experience in the scientific area. At college he majored in biology and minored in chemistry. Before joining Advanced Instruments, he utilized his scientific training as an instructor of science, first in Pelham, New Hampshire, and then in Seattle, Washington. He brings to the Advanced sales force an in-depth knowledge of biology and the physical sciences, especially anatomy and physiology.

ADVANCEMENT FOR DICK GRAHAM



Richard D. Graham has been promoted to general manager of Beatrice Foods Co.'s Manufactured Milk plant at New Bremen, it has been announced by William G. Karnes, president of Beatrice Foods. Graham, a veteran of 14 years with Beatrice Foods, succeeds Dr. Arthur T. Mussett who has been promoted to the newly created position of director of European and Latin American Dairy Operations for the company.

Reared on a Missouri farm, Graham earned his B.S. degree in Agriculture from the University of Missouri and served with the U. S. Navy in World War II before joining Beatrice Foods in 1953. His

first post was in Research and District Quality Control for the Illinois Dairy District. He was advanced to New Bremen in 1955 and assigned to working with all plants in the Southern Ohio-Indiana District on production and quality control. In 1960, he was promoted to assistant manager of the New Bremen plant.

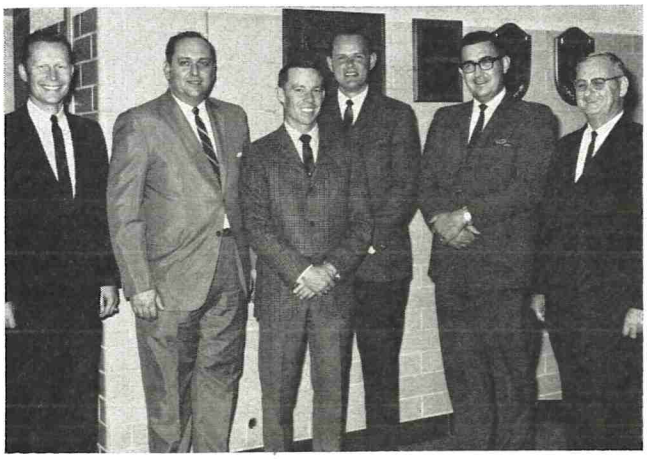
Graham is a member of the International Association of Milk, Food and Environmental Sanitarians.

SURGEON GENERAL RECEIVES 3-A AWARD ON BEHALF OF USPHS

The 1967 Special Citation Award made annually by the 3-A Sanitary Standards Committees for meritorious contribution to the Sanitary Standards program went to the U. S. Public Health Service. The Award originally scheduled to be made at the 3-A meeting at Omaha, Nebraska, on October 3 but had to be postponed to a later date.

The ceremony was re-scheduled for November 28, 1967, at Washington, D. C. at which time Surgeon General William H. Stewart accepted the citation on behalf of the U. S. Public Health Service. The ceremony was brief and informal with a number of industry and public health representatives in attendance. The scroll was presented by Fred J. Greiner, Chairman of the Dairy Industries Committee.

TEXAS A&M STUDENTS WIN SCHOLARSHIP AWARDS



The Lilly Ice Cream Company presented their Annual Scholarship Award to Bill Armstrong, and Terry Braswell, both senior students in Dairy Manufacturing at Texas A&M University on November 3, 1967. The awards were presented by Mr. Roy Barnes, President of Lilly Ice Cream Company and Barnes All-Jersey, and Mr. Wally Anderson, Sales Manager of Lilly Ice Cream Company.

Identified (l. to r.) in the accompanying photograph are: Mr. Wally Anderson, Sales Manager of Lilly Ice Cream Company; Dr. C. W. Dill, Associate Professor of Dairy Science, Mr. Bill Armstrong and Mr. Terry Braswell, recipients of the Award; Dr. H. E. Randolph, Associate Professor of Dairy Science; and Mr. Roy Barnes, President of Lilly Ice Cream Company.

TEXAS A&M DAIRYMAN'S SHORT COURSE

An interesting program was offered at the annual Dairyman's Short Course at Texas A&M University at College Station on November 16 & 17, 1967. The meeting was sponsored by the Department of Animal Science at the University in cooperation with the Texas Agricultural Experiment Station and Extension Service.

Featured on the first day's program were discussions on herd replacement costs, a breeding program based on A-1 sires available, challenges and opportunities in dairy farm engineering and programmed herd health. The second day of the meeting was devoted to discussions on the imitation milk challenge and its effects, practical approaches to milk quality and the pesticide and herbicide residue problem.

Staff members of Texas A&M departments and the extension service were assisted by representatives from other state Universities in presenting the program. The Dairyman's Short Course is designed to serve the needs of all dairymen, milk plant fieldmen, commercial feed company fieldmen and others directly or indirectly interested in the future of the dairy industry in Texas.

SCIENTIST SEEKS METHODS OF MEAT QUALITY CONTROL

Germ-free meat is carefully removed from a side of pork using modern, surgical techniques. Carefully, the aseptically clean meat is taken to another laboratory. Every effort is made to keep the meat covered to avoid risking contact with germs. Then, a scientist in a clean white lab coat carefully—but deliberately—contaminates the meat with bacteria!

This series of techniques has been practiced many times in the laboratory of Dr. James F. Price, Michigan State University scientist. He goes through a lot of trouble to get a germ-free meat sample so he can deliberately put specific bacteria into the meat. His reason: to help develop quality control methods to prevent the possibility of meat spoilage and food poisoning.

"By using grem-free meat," explains the MSU Department of Food Science professor, "we can put a specific bacteria in the meat and determine the ef-

fects of this microorganism on the meat. We know which bacteria cause a particular kind of spoilage and are trying to prevent this spoilage by detecting it early in the processing and marketing cycle.

"Our main aim is to develop fast tests for quality control in the meat processing industry. Once we establish the kinds and numbers of bacteria that can cause certain chemical and physical changes in meat, we should be able to develop fast tests for determining when meat is being contaminated and what can be done about it."

At present, Dr. Price is comparing three different methods for quality control testing. But he is finding that specific types of bacteria influence the reliability of these tests. "We are trying to develop a fast test that will give us quick readings on all the types of bacteria present," says Dr. Price. "Then, we'll want to know whether these bacteria are going to cause any damage, what kind of spoilage will result and what can be done to prevent this spoilage."

Dr. Price is currently studying changes in muscle protein and how these changes are affected by specific bacteria. He's also comparing different forms of processing and their effects on bacteria.

PHS TO STUDY SOLID WASTES AS FUEL SOURCE

Engineers in a government-supported research project hope to find a new way to get rid of trash and other solid wastes by using it as fuel in a jet engine. They plan to use the heat to produce electric power. The Public Health Service's National Center for Urban and Industrial Health in Cincinnati has contracted with the Aerospace Commercial Corporation, Palo Alto, California, to direct the design study.

"Europeans, recognizing the potential of solid waste as a fuel, have burned it in steam boilers to recover the heat and generate electric power," says Jerome H. Svore, Director of the Center. "We may borrow their approach to solid waste disposal and even develop improved power generating units through the application of aerospace technology."

Here, basically, is how the system proposes to convert the heat from burning solid waste into electricity. Community solid waste, consisting chiefly of paper products and some metal and glass, is fed first into a shredder where it is reduced to a uniform size and then into a dryer where moisture is removed using waste heat from the jet engine. Shredding and drying the material provides a more homogenous mixture that will burn quickly and cleanly.

The solid waste is injected into a combustion chamber and burned together with high pressure air—supplied from the compressor of the jet engine—to produce hot clean filtered gases. The clean, filtered gases then pass through a jet engine turbine to drive the engine's compressor and through a second gas turbine to drive an electrical generator. A waste heat boiler reclaims a part of the heat from the turbine exhaust gases. Steam from this boiler drives an auxiliary turbine-generator to produce additional power. Finally, the warm gases from the boiler circulate through the solid waste dryer and exhaust into the air.

The preliminary design study for this research and development program will extend to mid-1968. If this study proves the system is feasible a pilot plant should be operable by mid-1971.

INTERNATIONAL DAIRY AUTHORITY TO ADDRESS MASTITIS COUNCIL MEETING

Swedish agricultural scientist Dr. Carl Olof Claesson will address the annual meeting of the National Mastitis Council to be held Feb. 15-16 at the Sherman House in Chicago. Dr. Claesson is head of the experimental division for cattle husbandry at the Agricultural College of Sweden in Uppsala. His presentation, scheduled for 11:00 a.m. on Feb. 15, is entitled "Let's Clear the Air on Vacuum Fluctuation and its Effect on Udder Health."

He is coming to the United States under the sponsorship of the Milking Machine Manufacturers Council of the Farm and Industrial Equipment Institute.

Dr. Claesson is internationally known for major research projects utilizing monozygotic (identical) twins in regard to milking intervals and lactation studies and in regard to mastitis and milk composition and properties. Currently more than 50 sets of monozygotic twins are included in his research herd. Claesson holds BS, MS and Doctor of Agricultural Science degrees from the Agricultural College of Sweden.

INDIANA TO ENFORCE SOFT PIES REFRIGERATION

Frank Fisher, Director, Division of Food and Drugs, I.S.B.H., recently invited pie bakers from Indiana to a meeting concerning the storage, transportation, and display of synthetic-filled soft pies. These pies require refrigeration at all times, he said. In studies conducted at the State Food, Drug, and Dairy Lab "only one has ever been found that wasn't perishable," Frank indicates. T. L. Eddleman, Director, Food, Drug, and Dairy Lab has used a modified Public Health Service analysis method which has been presented to the bakers for their verification of results in commercial labs.

Bakers have been told that if they can demonstrate

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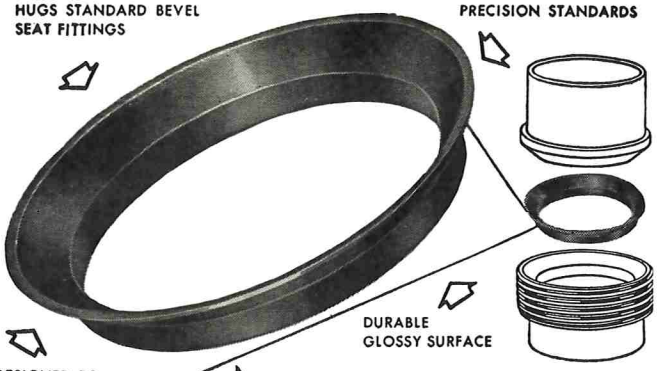

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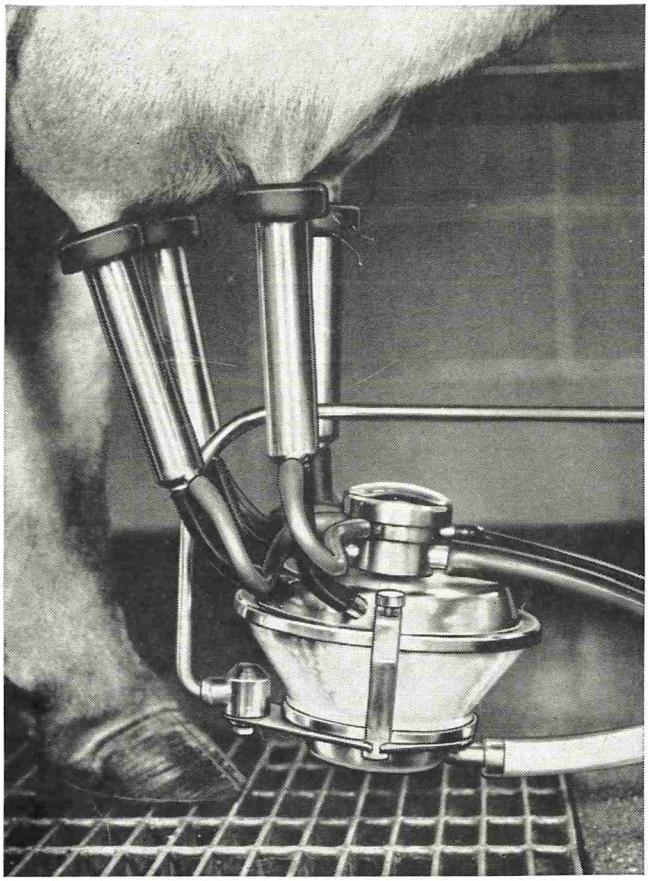
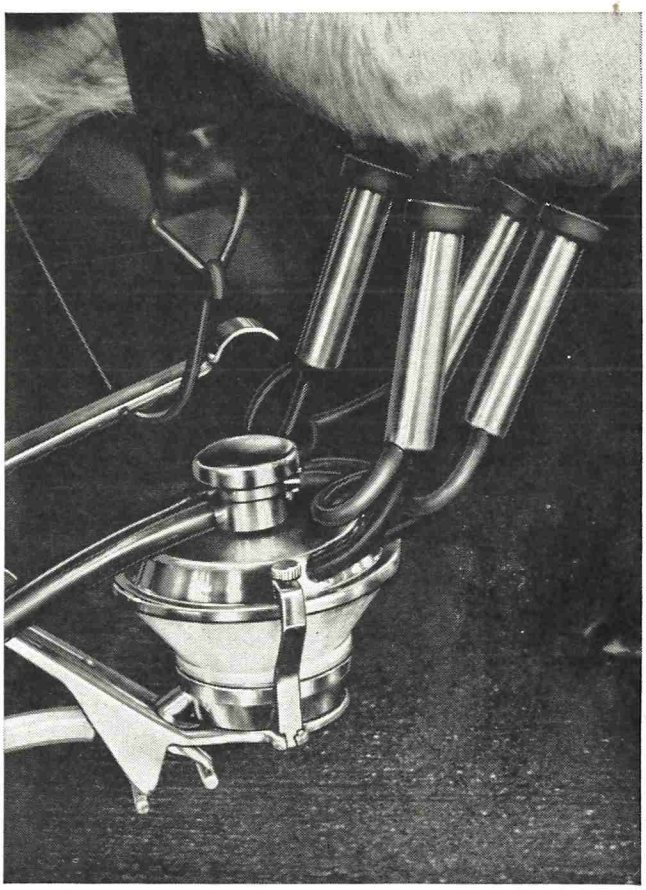


Surge Lo-Profile Breaker Cup for the Milking Parlor



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