

*Journal of*

# MILK and FOOD TECHNOLOGY

**49th ANNUAL MEETING**  
OCTOBER 24, 25, 26, 27, 1962  
Ben Franklin Hotel — Philadelphia, Pa.

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*Official Publication*

International Association of Milk and Food Sanitarians, Inc.

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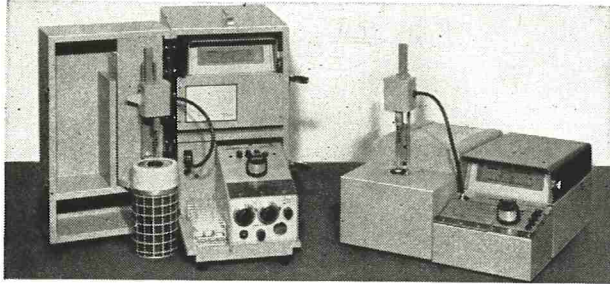
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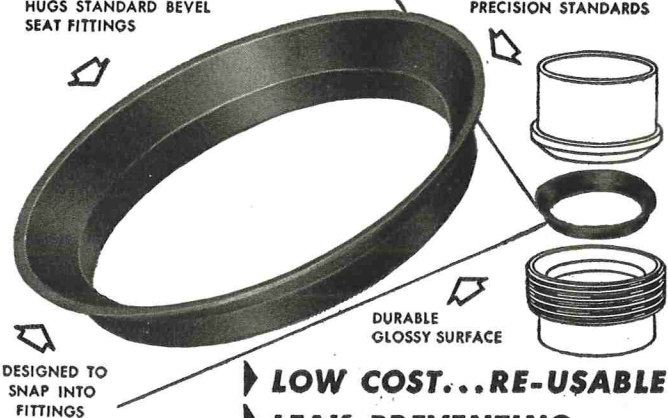
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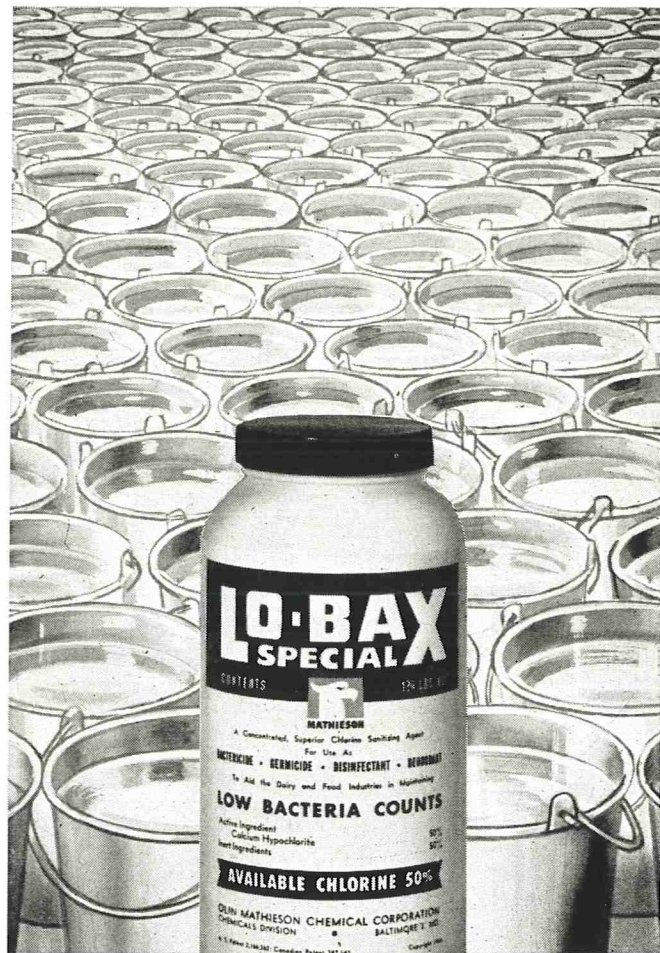
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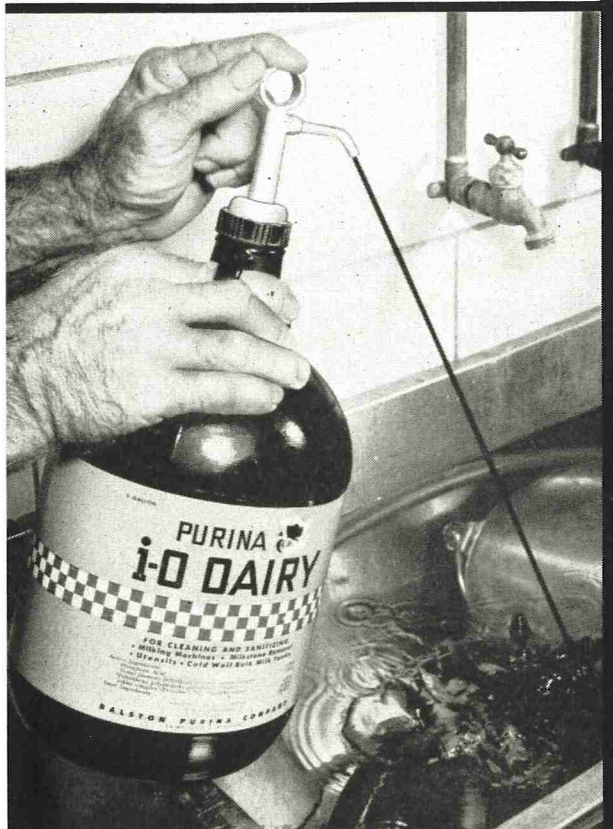
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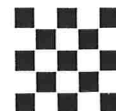
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# EDITORIAL

## Which way are we moving?

Quite regularly the *Journal* publishes news items dealing with the newer problems in environmental sanitation.

Within the past five years this phase of public health control has received increasing attention. The Congress has become cognizant of the forces of our environment. Volumes of expert testimony have been given on air pollution, radioactivity, chemical complexes in soil, water and food, water pollution control and metropolitan sprawl. And along with this vast array of testimony has come the appropriation of funds by the Federal Government in amounts not even dreamed of a decade ago.

We believe this is a fine thing. Too long the physical forces of man's environment have been relegated to a subordinate position. Perhaps this present era of *the new look* at our environment has been evolutionary in nature. For a long while public health was concerned with infectious and communicable disease control. Maternal and child health problems were pressing and prominent. Basic sanitation had to be promoted and established. And even today, these programs must go on because we are far from our ultimate objectives.

Yet with these reports, studies, expert testimony, surveys and increasingly large Federal health appropriations, sight seems to be lost of where public health work *REALLY* is done. This is at the local level. It is in the county, the district, and the city. In our country today there are *too* many areas that have no local health service. There are many cities which have only a token health force. There are too many people, it seems, who take the attitude that as long as there are no catastrophic disease outbreaks, public health service is not a very critical need.

If public health, as viewed by experts, is going to progress, and if these new environmental problems are going to be attacked, these things can't be done in research laboratories, nor in the confines of the conference room. Of course, planning and research must be done, but how many among us preach the word of stronger, larger, more competently staffed and more effective local health departments?

Sometimes one wonders if this massive action at the Federal level may not generate a sense of lethargy at the local level. The impression may well be gained that all problems can be solved if the Congress appropriates more and more funds. While no one discredits adequate funds, we shouldn't be lulled by the thought that huge appropriations are a cure all and that Federal agencies have all the answers.

With the present complex of problems, we feel two very basic needs must be met. First, local public health must be bolstered, expanded and vitalized. We feel that in many states, much too little is being done to awaken the local citizenry. The ordinary citizen knows little about *REAL* public health protection unless he is informed about it.

Then, secondly, we need a massive training program. CDC, and SEC both do an excellent job of training, *but they do not reach enough people*. Some communities claim lack of funds to send their health workers for training. In other cases, the real worth of this training is not fully understood nor appreciated.

From the Federal level, and in cooperation with the several states, expert teams should be sent out in the field with not one but a whole series of well designed and executed training programs. If, "*The mountain won't come to Mohammed, then Mohammed had best come to the mountain*".

Our greatest environmental health asset, to get a big job done, is good work at the local level. If we get too heavy at the top we'll topple over and all the best laid plans for modern public health and upgraded sanitation practice will fall far short of the mark.

HAROLD S. ADAMS  
Indiana University School of Medicine  
Indianapolis 7, Indiana

## SANITATION – ITS ROLE AND REQUIREMENT UNDER THE POULTRY PRODUCTS INSPECTION ACT<sup>1</sup>

W. F. DOSSEY

*Agricultural Marketing Service  
Inspection Branch, Poultry Division,  
United States Department of Agriculture  
Des Moines, Iowa*

It is indeed a real pleasure to meet with you today and to take an active part in the annual meeting of the International Association of Milk and Food Sanitarians being held here at Des Moines, Iowa.

Poultry Inspection service in the United States is not new. Only the mandatory aspects of it are of rather recent origin. The first Federal Poultry Inspection Service was inaugurated on November 15, 1926. This service consisted of the inspection of live poultry at the railroad terminals and poultry markets in and around New York City. This inspection was conducted under an agreement between the U. S. Department of Agriculture (Bureau of Agricultural Economics) and two cooperating agencies—the New York Live Poultry Commission Merchants Association and Greater New York Live Poultry Chamber of Commerce.

The live poultry inspection work accomplished two purposes. The principal purpose was to determine, by palpation, the average amount of feed in the crop of a sample of birds in each railroad car or truck prior to unloading and delivery to live poultry buyers. If the amount of feed in the crops was found to be in excess of the amount permitted, the poultry would be held for reinspection. Cars of poultry were not permitted to be unloaded until they passed inspection. This inspection was also for the purpose of determining that certain prohibited materials were not included in the feed on the morning of unloading.

The other purpose of this live poultry inspection was to remove and to destroy for food purposes all sick poultry found at the time of inspection.

The first Federal poultry inspection for eviscerated poultry was a voluntary program supplied in 1927 to a large soup company in the East. It was requested because the Canadian Government required that canned poultry products shipped into Canada be accompanied by a Federal export certificate attesting that the product had been officially inspected and had been found to be wholesome.

During 1927, only one plant used the new inspection service developed by the Department. In 1928,

New York City followed the lead of Canada by requiring that canned poultry products sold in the city be officially inspected. This resulted in five additional plants requesting inspection from the Department to meet these requirements. By the end of 1928, six plants were operating under the voluntary poultry inspection program. During that year 3,150,423 pounds of poultry were inspected, 11.72 percent of which was condemned as unfit for food. The percentage of poultry condemned was markedly decreased during subsequent years, since canners under inspection soon found that it was not profitable to present inferior quality poultry for inspection purposes.

Much progress was made in the development of regulatory procedures and criteria governing inspection work during the years from 1928 to 1940. On July 1, 1940, there were approximately 35 plants operating under inspection. In that year 76.3 million pounds of dressed poultry were inspected with the percentage of condemnation being 1.64 percent.

By 1950 the development of the poultry industry had reached the point where it was considered practicable to issue regulations governing the sanitary conditions under which poultry was to be slaughtered and dressed. Sanitation inspection was furnished in dressing plants which applied for such service and which met the sanitary requirements. Eviscerating plants operating under inspection were not permitted to receive dressed poultry for eviscerating unless it had been slaughtered in an official establishment. By the end of the year 1950, 155 plants were operating under inspection and a large number of dressing plants were receiving sanitation inspection. By the end of 1954, 260 plants were operating under inspection, and in that year over a billion pounds of poultry were inspected for wholesomeness. Most of the increase since 1945 has been in inspected poultry prepared for sale as ready-to-cook poultry.

The Poultry Products Inspection Act was passed by the 85th Congress and signed into law by President Eisenhower on August 28, 1957. The law did not become fully effective until January 1, 1959. We now have approximately 840 plants operating under the mandatory inspection program. The thirty years-plus experience in the field of poultry inspection has served as a firm foundation which has enabled the

<sup>1</sup>Presented at the Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Des Moines, Iowa, August 14-17, 1961.



Inspection Branch, Poultry Division, Agricultural Marketing Service, to properly handle the job delegated to it under the Poultry Products Inspection Act and provided a relatively smooth transition from the voluntary to the mandatory inspection program.

Due to the large expansion of the number of poultry processing plants under federal inspection upon passage of the Poultry Products Inspection Act, the Department initiated a rather comprehensive training program for inspection personnel which included both on-the-job training and classroom instruction.

New inspectors normally undergo six months to a year of on-the-job training which includes:

1. Orientation training in the objectives of USDA and the poultry inspection program.
2. Training at the plant in actual inspection of birds and the use of inspection criteria.
3. Scheduled conferences to discuss with instructors various aspects of the training.
4. Assigned outside reading including copies of the Poultry Products Inspection Act, regulations, and other material related to the job.
5. Supervisory training to prepare the new inspector for later supervisory positions.

The entire training period follows a plan of study set up by USDA. Training guides and instruction sheets prepared by the inspection service go to supervisory personnel at all plants where new inspectors receive training. At the end of the on-the-job training period, station supervisors report on the performance of each new inspector.

Later, advanced training and refresher courses in the classroom are offered to the working inspectors. Usually held at times when it will not interfere with the inspectors' official duties, these schools run from one to two weeks. They are designed to keep the already qualified inspector informed of the latest developments in the industry and the latest changes in inspection methods.

The classroom program was used in a special way during 1958 to facilitate training the many new inspectors needed under the Poultry Products Inspection Act. Several months before the Act became fully effective, USDA held two "train-the-trainers" schools. About 78 inspectors attended one or the other of these schools. Later, in 1958, a series of one and two-week schools led by trained supervisors drew 269 inspector-trainees.

By mid-December 1959, less than a year after the Poultry Products Inspection Act went into effect, 1600 qualified inspectors were working at poultry slaughtering and further processing plants throughout the country. These included 850 new men trained during 1958 and 1959.

The program is further specialized to facilitate training of both veterinary and lay inspectors. The

lay inspector trains for 12 months—twice as long as the veterinarian. Trained lay inspectors often work on the inspection line at large poultry slaughtering plants. They may condemn carcasses with easily recognizable systemic disease conditions. But those carcasses falling in a doubtful category must await examination by the veterinary inspector. In all questionable cases, the veterinarian makes the final decision. Lay inspectors also perform most inspection tasks at convenience foods or further processing plants. Poultry comes to these plants after being certified as wholesome at the time of slaughter. The inspectors' work is primarily one of checking cleanliness and procedure at the plants and reinspecting for condition of all components of poultry food products.

The Declaration of Policy in the Poultry Products Inspection Act says: "It is hereby declared to be the policy of Congress to provide for the inspection of poultry and poultry products by the inspection service as herein provided to prevent the movement in interstate or foreign commerce or in a designated major consuming area of poultry products which are unwholesome, adulterated, or otherwise unfit for human food."

The term "wholesome" is defined in the Act to mean poultry which is ". . . sound, healthful, clean, and otherwise fit for human food." The term "unwholesome" is also defined in the Act as those conditions which would be contrary to the terms defined as "wholesome."

The Act also defines "adulterated". In this connection, it should be pointed out that the U. S. Department of Agriculture has full responsibility for preventing adulteration of poultry under the Poultry Products Inspection Act, an authority which previously had been vested in the Food and Drug Administration under the Food, Drug and Cosmetic Act. The definition for "adulterated" as applied to poultry and poultry products under the Act includes among other things ". . . If any substance has been added thereto or mixed or packed therewith so as to increase its bulk or weight, or reduce its quality or strength, or make it appear better or of greater value than it is."

In general terms, the Poultry Products Inspection Act requires USDA to:

1. Determine which poultry is fit for food. This determination must be made at the time of slaughter and evisceration. An ante-mortem inspection must be made of each lot of poultry to be slaughtered, and a post-mortem inspection is required on each individual poultry carcass.

2. Promulgate regulations which establish minimum standards for premises, facilities, equipment and poultry processing operations, and which require

processors to operate official establishments in compliance with these standards. These regulations assure consumers that poultry is processed and handled in accordance with sound operating procedures and that sanitation and wholesomeness are of prime importance during processing.

3. Make certain that all poultry and poultry products are properly labeled in accordance with the law at the time the poultry leaves a processing establishment and that no misuse is made of officially identified materials.

4. Make sure that poultry is not adulterated through the addition of excess moisture, poisonous materials, or in any other manner.

How does a poultry processing plant qualify for inspection service? There are certain definite requirements which must be satisfied before a poultry processing plant may receive the benefits of the Poultry Products Inspection Act. The usual procedure followed by a plant desiring such service is as follows:

1. The plant submits an "Application for Inspection" to the appropriate area office. There are six area offices located throughout the nation. An area office is located in each of the following cities: Philadelphia, Pennsylvania; Chicago, Illinois; Des Moines, Iowa; San Francisco, California; Atlanta, Georgia; and Dallas, Texas. The completion of the application requires the applicant to state whether or not his poultry product will be shipped by him or with his knowledge in interstate commerce. An affirmative answer to this question is necessary because the product must be involved in interstate commerce in order for a plant to be eligible to receive inspection service under the PPIA.

2. The plant may request a survey of its plant and plant facilities, should it so desire. The purpose of such a survey will be to determine what changes, if any, will be necessary in order to bring the plant's facilities into compliance to meet the minimum standards of the regulations.

3. The plant submits four sets of plant drawings to the Facilities Section of the Washington office. These drawings are carefully scrutinized by qualified inspection personnel to determine if plant layout and construction are suitable and will meet the minimum requirements of the regulations. Should the drawings be found satisfactory, they are stamped "approved" and a copy sent back to the firm. If not satisfactory, the reasons for not granting approval are listed and all copies returned to the firm unstamped.

4. The plant must submit forms for "Certification of Water Potability", issued under the authority of the State Health agency, which certifies to the potability of the water supply.

5. All labels to be used by the plant must be submitted to the Food Products Section of the Washington office for approval. No label may be used by a plant until properly approved, the plant has qualified in all other respects for inspection service, and permission granted by the Department to inaugurate service under the Poultry Products Inspection Act.

6. A final survey may be requested by the plant at any time it is believed that the plant and plant facilities are in agreement with the approved drawings and the regulations. The final survey will be conducted by technical supervisory personnel from the appropriate area office. The plant will be carefully examined to determine that its construction and facilities are as they are depicted on the approved drawings and that the plant will meet the minimum requirements of the regulations in all respects.

That, in general, is the procedure that should be followed by any poultry processing plant which desires to receive inspection service under the Poultry Products Inspection Act.

The establishment and maintenance of good sanitation practices in each plant coming under the poultry inspection program is of prime importance to the Department. A lot of effort, time, and money are usually expended, both by the inspection department and the processing plant, to insure that the proper facilities will be available for the processing of poultry under government supervision.

As stated previously, as part of the requirements for qualifying a plant for poultry inspection service, it is necessary that sufficient potable water for the needs of the plant be available and that a survey of plant facilities be made to determine what necessary changes may have to be carried out.

The water supply must be suitable for drinking purposes and the processing of poultry. It must be in sufficient quantity and of adequate pressure to insure that all poultry being processed will be washed properly and to provide an ample supply of hot water for clean-up purposes. In plants conducting slaughtering and eviscerating of poultry, the quantity of water available for processing is very important. Generally, we feel that plants conducting the processing of chickens should have available five gallons of water for each bird processed. Plants processing turkeys need to have thirty gallons of water available for each bird processed.

The conducting of plant surveys is an extremely important function of supervisory inspection personnel. It is their responsibility to make sure that the plant facilities and plant layout are as shown on the approved drawings and in line with the rest of the requirements of the regulations. There are many important items to be considered when making such a survey. Among the important considerations

are such things as the outside premises. Is there sufficient drainage? Are there proper hard-surfaced areas for loading and unloading, with proper dock facilities for both ready-to-cook and inedible products? Plant construction is vitally important to insure that the facilities are such that they can be easily maintained and cleaned. General requirements for floors are that they be impervious to moisture and provided with adequate drainage that is properly trapped and vented. Walls, posts, partitions and doors in rooms where exposed products are prepared must be smooth and impervious to moisture to a height of six feet above the floor to enable thorough cleaning. All surfaces above six feet must be smooth and water resistant. Ceilings must be moisture resistant in rooms where exposed products are prepared or handled, and they must be finished and sealed to prevent collection of dirt and dust that might sift through the floor above or fall from collecting surfaces on equipment or exposed product.

All drains and gutters should be properly installed with approved traps and vents. The drainage and plumbing system must permit the quick runoff of all water from plant buildings and of surface water around the plant and on the premises.

The sewage system must have adequate slope and capacity to insure its prompt and efficient removal. Grease traps and sumps must be suitably located. They are not permitted in processing rooms where edible products are being handled. They should be properly constructed with inclined bottoms and furnished with suitable covers. Toilet soil lines should be separate from house drainage lines to a point outside the buildings unless an automatic backwater check valve is installed to prevent back flow.

Adequate lavatory and toilet accommodations must be available. Toilet facilities must be furnished at the following ratio: 1 to every 15 persons of the same sex, 2 for 16 to 35, 3 for 36 to 55, 4 for 56 to 80, etc. Sufficient lavatories with soap dispensers and towels must be available and signs posted in a conspicuous place directing employees to wash their hands before returning to work. Each processing room or area must be provided handwashing lavatories that are other than hand operated (such as foot or knee operated devices).

Good lighting is very important in the maintenance of good sanitation and in carrying out post-mortem inspection techniques in an efficient manner. Lighting must be at least 30 foot candles in processing areas, 50 foot candles at inspection points, and 5 foot candles in other areas such as dry storage and warehouse facilities.

Adequate ventilation is a must if proper plant sanitation is to be maintained. Such facilities are

necessary for prevention or elimination of objectionable odors and to minimize moisture condensation. Eviscerating and picking rooms, offal rooms, and cooking areas are especially in need of good ventilation.

Equipment and utensils to be used in plant operations must meet certain standards. The type of construction, ease of cleaning, and placement of all non-portable equipment are important factors to be considered. Equipment should be constructed of rust-resistant material such as stainless steel, galvanized iron, or aluminum. Ease of cleaning is a most important factor. Equipment or machinery that is complex in make-up should be designed for easy dismantling to assure that all parts of such equipment will receive their share of attention and remain in a good, clean condition. Proper placement of equipment in relation to walls and other equipment is another factor taken into consideration when making plant approvals. Complete accessibility is paramount to the maintenance of good sanitation on all permanently installed equipment. Generally speaking, the Department requires at least 30 inches of clearance between equipment and walls or other pieces of equipment.

Wood or wooden equipment are not allowed in processing areas. This type of equipment does not lend itself to good sanitation and experience has shown that material that is not impervious to moisture cannot be cleaned properly nor maintained in a good state of preservation over a period of time.

Conveyor belts, either metallic or impervious non-metallic types, with which poultry or poultry products come into direct contact, should be furnished with a continuous water spray to insure their sanitation at all times. Ice shovels are required to be entirely smooth and constructed of rust-proof impervious material.

Plant personnel are required to wear clean clothing at all times. Street clothes are not acceptable. Lockers and dressing rooms must be furnished for employees in order that they may change into proper plant attire. Head coverings for all persons handling exposed poultry or poultry products are required. Hands and fingernails are required to be kept clean at all times. Persons with infected cuts, boils or open sores are not allowed to handle dressed poultry, poultry products handling equipment. The use of tobacco, the eating of food, or any other personal habit which may result in a nuisance, is not permitted in any room where exposed dressed poultry or poultry products are being prepared, processed, or otherwise handled. No person affected with any communicable disease in a transmissible stage is permitted in any part of the plant where exposed

poultry or poultry products are being prepared or handled.

Poultry inspection personnel, in general, are charged with the responsibility of conducting ante-mortem and post-mortem inspection of poultry in plants conducting slaughtering and eviscerating operations, maintaining proper plant sanitation and sanitation practices, seeing that label requirements and formula compliance are being carried out correctly, and preventing practices or procedures that might result in adulteration of poultry or poultry products.

Before each day's operation begins, the entire plant and plant facilities receive a thorough sanitation check to see that all rooms, compartments, and equipment have been cleaned properly and are in a suitable state or condition to begin processing operations. Additional plant clean-ups are carried out during the noon hour and at any other time it becomes necessary to eliminate or prevent an insanitary condition from developing. This is one of the most important duties and functions of inspection personnel. Should certain areas or equipment not be clean, it is the duty of the inspector-in-charge to see that all oversights or omissions that may have occurred in the plant's sanitation program are corrected immediately, or to deny the use of such equipment or facilities until such time as they receive the proper attention and cleaning.

Once the day's operation has begun, inspection personnel are concerned with the problem of maintaining plant sanitation at all times to see that proper operating procedures are in use. Such problems are many and varied, depending on the type of operation.

In slaughtering and eviscerating plants there are many items of major concern that must be properly carried out or executed if the plant is to be successful in producing a clean, wholesome, ready-to-cook product. The bleeding operation must be adequate to insure proper confinement of blood to a relatively small area. Poultry must be allowed enough time to bleed out and to insure that breathing has stopped prior to scalding to prevent aspiration of scald water into the respiratory system of the bird. Attention must be given to the scalding equipment, itself, while in use. Adequate amounts of fresh water must be introduced into the scalding and enough allowed to overflow to maintain the scald water in as clean a state as is possible, while still allowing the birds to receive an effective scald. No direct water connections are allowed between the scalding and the potable water line. Fresh water must enter the scalding from above from a broken connection in order to prevent the possibility of contaminating the potable water line should a drop in pressure within the water line occur and allow the back flow of scald water.

After bleeding, scalding, and picking the birds must go through washing equipment so that the outside surface of the carcass is completely washed before evisceration occurs. No unnecessary cuts are allowed until the outside wash of each bird is complete. Feet may not be removed until the outside wash is finished to prevent the washing away of the joint fluids which may be indicative of certain disease processes.

The method of opening cut for evisceration purposes is extremely important in maintaining good sanitation and prevention of contamination of birds and hands of plant personnel conducting these operations. Great care must be exercised to see that the intestines are not cut or nicked in the opening of carcasses. Cuts should be centered as much as possible to prevent the opening of the thigh area which may lead to the formation of pockets in which excess amounts of water or contaminating agents may lodge or collect.

After eviscerating, the bile sac must be carefully removed from the liver to prevent contamination of the carcass with the bile fluid. Lungs and oil sacs must be completely removed and the carcass will then undergo a thorough inside and outside final wash before it is placed in clean chilling media to cool the bird to the required temperature before packaging.

Inspection personnel are concerned with additional sanitation responsibilities to see that plants conduct a good control program to keep all types of vermin, such as rats, flies and cockroaches, from gaining entrance into the plant. Pest control is a vital necessity to insure that all edible products will be protected, both directly and indirectly, from such contaminating agents. Therefore, it is extremely important to see that good housekeeping practices are followed to reduce the possibility of breeding places or other conditions that may be attractive to such vermin. Plants where poor sanitation practices are allowed, such as allowing offal and inedible waste or refuse to accumulate, are apt to be confronted with a serious vermin control problem.

These are some of the sanitation requirements and problems that are encountered every day by inspection personnel who are charged with the responsibility of enforcing the regulations in poultry processing plants operating under the Poultry Products Inspection Act.

The establishment and maintenance of good sanitation and sanitation practices in the large number of poultry plants that are subject to Public Law 85-172 has not been an easy task. The Department requests and receives, in the great majority of cases, the wholehearted cooperation of plant management

in carrying out the different phases of plant sanitation and other duties required under the regulations governing the Act. This always makes the job easier for the Department and the best results are realized when a spirit of cooperation exists between inspection personnel and plant management. The maintenance of good sanitation is a continuous process, and continued improvements in inspection and

sanitary techniques are resulting in cleaner, more efficient, plants, producing products of a higher quality than ever before. The protection of human health is the first and principal object of the inspection program. Consumers benefit by assurance that the poultry they are buying and eating are wholesome and have been prepared under clean, sanitary conditions.

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## THE LAND-GRANT SYSTEM AND THE MILK SANITATION PROGRAM<sup>1</sup>

V. H. NIELSEN

*Department of Dairy and Food Industry, Ames, Iowa*

The Centennial of the Land-Grant college system is fittingly observed by the International Association of Milk and Food Sanitarians as it will be by many other professional and scientific groups. Much of the initiative to establish systematic and uniform procedures in the examination of milk products and many contributions to the scientific basis for a sound milk sanitation program came from workers in Land-Grant universities. Through their academic and extension teaching, the Land-Grant universities created a force of industry workers, milk sanitarians and dairy farmers who together elaborated and enforced the high standards of milk sanitation which give consumers of milk and dairy products in the United States protection unequalled in the world and which is an essential requirement for the success of our milk industry.

During the coming year many academic, professional, business and trade groups will recognize the 100th anniversary of the Morrill Act. When President Lincoln signed the Act on July 2, 1862, neither he nor the authors and supporters of this momentous legislative measure — particularly Justin S. Morrill of Vermont and Jonathan B. Turner of Illinois — could possibly have assessed the result we see about us today in the form of the Land-Grant college system and its accomplishments. Yet a century later, we must give them credit for having exercised profound vision and imagination when they acted to convert part of this nation's land resources to the development of its potentially greater human resources through education.

Judged by economic and political philosophies of our age, the Morrill Act seems reasonable and logical enough. Seen on the background of the social traditions of the 1860's, it must be regarded as a

major feat of statesmanship. Measured by our yardstick of economic values, the grant may look modest. It involved an endowment to each state of 30,000 acres of land (at an average value of \$1.25 per acre) for each congressional representative. Time and economic growth increased the value of this endowment, but it was even more important that an idea had been born and that a large part of the republic's natural bounty was committed to promote liberal and practical education of the agricultural and industrial classes.

In our admiration for the originators of the Land-Grant college idea, we must not forget the state legislatures who eventually recognized their obligation to support the colleges. Nor must we forget the several generations of administrators, teachers and researchers who translated the idea into action and husbanded the resources so that the Land-Grant college system became this nation's largest single source of trained and educated manpower. The 68 Land-Grant universities today enroll 20 percent of this country's college students. They grant 40 percent of all doctorates, 50 percent of the doctorates in sciences, engineering and health professions, all of those in agriculture and 25 percent of those in arts, languages, business and commerce.

The kind of practical training envisioned in the Morrill Act set the Land-Grant colleges apart from the older universities in the United States and Europe. It emphasized professional and specialized education designed to meet the needs of a young, vigorous and growing nation wanting to apply the discoveries of science and technology to its life and growth. It was unique in its concept of conserving, creating and transmitting knowledge through a wide variety of graduate and undergraduate curricula, through basic and applied research and through extension of the university teaching beyond the campus

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<sup>1</sup>Presented at the 48th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Des Moines, Iowa, August 14-17, 1961.

to the entire population in adult education courses, conferences, institutes, radio and television.

In carrying out these functions the Land-Grant universities themselves established an important tradition and infused the educational philosophy in this country with the noble idea which inspired the authors of the Morrill Act, namely, that practical and liberal education should embrace all knowledge in service to all people. In the process the Land-Grant universities have reached the highest academic standards and goals. Of 38 living American Nobel laureates who received their academic training in the United States, 20 earned degrees from Land-Grant universities. A catalog of accomplishments of Land-Grant scientists include some of the greatest research achievements in medicine, engineering and agriculture.

It is appropriate that the Land-Grant Centennial should be recognized by the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS during this Golden Anniversary Meeting. Primarily through the conscientious work of the members of this Association does our country enjoy the highest standards of milk and food sanitation in the world. Nowhere else is the public health so well protected against potential hazards in foods. Credit for this should go to the medical profession, the U. S. Public Health Service and state and local health officers. It is not difficult to show, however, that much of the knowledge, new scientific developments and educational work which implemented this high standard came directly or indirectly from the Land-Grant college system. Many of the medical people and public health workers themselves were graduates of the Land-Grant schools and many of the scientific contributions upon which rests our present milk and food technology were made by workers in Land-Grant institutions. One needs only review the historical accounts of this development and scan the dairy literature or the bibliographies of successive editions of "Standard Methods for the Examination of Dairy Products" to be convinced of this. H. O. Russell at the University of Wisconsin was among the first to show the relationship between infestations of microorganisms and the keeping quality of milk. S. C. Prescott at the Massachusetts Institute of Technology was the first to point out the need for uniform methods in the examination of milk for sanitary quality. He took the initiative to formulate the first standard procedures and suggested the establishment of a committee to study the various methods then used for bacteriological examination of milk and to recommend a uniform procedure.

Russell from the University of Wisconsin was the first chairman of that committee. Thus the leadership which eventually produced the first "Standard Methods" came from the Land-Grant institutions and many Land-Grant scientists served on the committees which prepared subsequent editions.

The development of dairy industry curricula in many of the Land-Grant universities lead to strong teaching and research programs in the bacteriology and chemistry of milk products. One result of this was the training of workers and leaders in the dairy industry who thoroughly understood the scientific basis for milk sanitation and therefore appreciated and accepted the continuing demands on the industry for refinements in processing technology in the interest of public health. An equally important product of this development was the training of capable milk and food sanitarians with truly professional attitudes toward their work whether it be regulatory or educational.

A milk sanitation program, the standards of which were continuously changed and improved in the light of new findings, was not always easy to sell to dairy farmers and the dairy industry. A large share of this task was assumed by dairy industry extension workers in many of the Land-Grant universities. In untold meetings and demonstrations did they teach dairy farmers the principles and practices of good milk handling, thereby doing spade-work essential to the program.

When all is told, the milk sanitation program in the United States must be credited not only with protecting the public health but also with making possible a milk industry having the size and stature of ours. How much milk marketing depends for its success on milk sanitation is not fully appreciated. The need for better nutrition through increased milk consumption in many of the world's underdeveloped countries is acknowledged by most people concerned with this problem. In many of these countries it is not lack of milk production alone which prevents undernourished peoples from reaching this goal but even more so the lack of sanitation. With this in mind, consumers, dairy farmers and the milk industry ought to recognize the blessing of a well developed, scientific milk sanitation program like the one which operates in this country. Without the slightest stretch of the imagination we can show that much of this program and its benefits came directly from the Land-Grant college system. It is one of the examples of how the Land-Grant system made life in the United States richer, happier and healthier.

# HOW THE AGRICULTURAL EXTENSION SERVICE AND THE SANITARIAN CAN WORK TOGETHER<sup>1</sup>

T. A. EVANS

*Associate Professor of Agricultural Extension  
University of Nebraska, Lincoln*

Cooperative Extension work has been defined as a partnership between each state land-grant college or university and the United States Department of Agriculture in cooperation with local governments and local people. Agricultural Extension is a unique service of three levels of government—national, state and local, organized to permit maximum flexibility and adaptation to local conditions and needs while, at the same time, carrying a hard core of purpose, objective, and focus (1).

The Agricultural Extension Service was established in 1914 by the Smith-Lever Act. Its major function is “. . . to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics and to encourage the application of the same. . . .”

Extension's function is education, not education in the abstract but education for action, education directed to helping people solve the various problems which they encounter from day to day in agriculture, home economics, and related subjects.

Financial support for Agricultural Extension work comes from the three levels of government mentioned above. While the proportion coming from each level varies by states the overall average for the United States is 40 percent from the federal government, 35 percent from state governments, and 25 percent from county governments.

Agricultural Extension is made up of over 14,000 workers, 11,000 at the county level, 3,300 at the state level, and 100 at the national level. They are located in almost every rural county in the United States. At the land-grant college or university in each state are specialists in practically every field which affect farm families including (a) production, (b) marketing, (c) use and development of natural resources, (d) farm and home management, (e) leadership development, (f) youth development, (g) family living, (h) community development, and (i) public affairs. These state specialists interpret scientific findings in their particular fields which county extension agents pass on to the people. Specialists also keep county staffs informed about national programs and policies and keep experiment station workers advised relative to local research needs.

On the national level are specialists who are available for assistance to specialists on the state level. Not to be forgotten, in addition to the paid staff, are over 1,275,000 unpaid volunteer leaders who help county staffs to assist more people.

From the above brief resume of the organization of the Cooperative Extension Service it is evident that it is quite similar to the organizational structure of public health agencies with the great number of local sanitarians on the city and county level and with specialists and consultants located in State Health Departments and, at the national level, the United States Public Health Service.

Before looking at how each of these two far flung agencies can be of assistance to each other it might be well to review the objectives of each.

In 1958, the Agricultural Extension Service took a close look at itself, its programs, and its objectives. Contained in the introduction to the report on the findings of this study (1) is the following statement relative to the organization's objectives: “. . . The Extension Service has always held high those objectives which help people attain (a) greater ability in maintaining more efficient farms and better homes, (b) greater ability in acquiring higher incomes and levels of living on a continuing basis, (c) increased competency and willingness, by both adults and youth, to assume leadership and citizenship responsibilities, and (d) increased ability and willingness to undertake organized group action when such will contribute effectively to improving their welfare.”

Objectives of the local health department might include, among others, (a) improvement of family living by improving environmental sanitation in the community, (b) maintenance and improvement of sanitary quality of certain products which farmers send to market, and (c) protection of the consumer, including farmers, from sub-standard food products.

Basically, the objectives of these two organizations are not essentially different. Both are concerned primarily with the welfare of the people. Means of attaining these objectives, however, may differ to a significant degree. Objectives of the Agricultural Extension Service or the county extension agent must be achieved by educational means. On the other hand, the sanitarian also has a responsibility for law enforcement. While the regulatory agent will most often resort to educational means to accomplish law enforcement, the extension worker can-

<sup>1</sup>Presented at the 48th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Des Moines, Iowa, August 14-17, 1961.

not rely on enforcement procedures to implement an educational program. A misconception still held by many people is that a sanitarian is strictly a law enforcement officer. Today the great majority of local sanitarians are highly trained professional people who rely first on education to achieve their objectives and use enforcement procedures only as a last resort.

In considering the specific areas in which extension personnel and sanitarians can cooperate we must take note of the changes taking place in the rural community. While the number of farm families is decreasing the standard of living of those remaining is rising at a rapid rate. The availability of electricity in rural areas has made it possible for farm families to have many of the conveniences long enjoyed by urban families. High on the list of these conveniences is the water pressure system. This, in turn, has required a waste disposal system. Availability of these conveniences outside of urban areas has also caused thousands of persons to move to the open country to build their homes. These people often find themselves confronted with problems with flies, mosquitoes, water supply, sewage disposal, dust, and noise to a much greater extent than was true in town. The result has been the development of environmental sanitation problems that did not formerly exist in rural areas. Seeking a solution to their problems people go either to the county extension agent or to the county health department for assistance.

Now how can the county agent and sanitarian work together to solve these environmental sanitation problems? Much, of course, can be done by education. This is usually considered to be the role of the county extension agent. But a county extension agent cannot be a specialist in all phases of rural living. More often than not he is a production major trained in the fields of livestock or crops. He may have in his office a bulletin on rural water supplies or sewage disposal systems or on how to control flies and mosquitoes. But the chances are that he is not familiar enough with this field to answer all of his cooperators' questions whether they be farmers or non-farm rural residents. Here is where the sanitarian and extension agent can complement the work of each other. With his specialized knowledge of environmental sanitation requirements the sanitarian can furnish authoritative solutions to many of the rural resident's problems.

One more factor that can enter into such a situation is the enforcement of sanitation requirements. Mr. Paul Rand Dixon, Chairman of the Federal Trade Commission recently said, "Tough policing is the backbone of voluntary compliance with the law." While this statement may sound a bit contradictory at first, I am sure all sanitarians will agree that it contains a great deal of truth. Education can go

only so far with some persons. Occasionally we encounter people who can be educated only by strict enforcement of legal requirements.

It is not meant to imply that county extension workers should routinely "wash their hands" of environmental sanitation problems and leave them to the county sanitarian to solve or that they can be solved only by law enforcement procedures. The county extension agent has a certain following or clientele, he has a certain influence with many rural families, and he has a responsibility to "help people attain greater ability in maintaining more efficient farms and better homes." By working together, however, the county extension agent and the county sanitarian can accomplish much more than by each working separately.

Another area in which cooperation between Agricultural Extension personnel and sanitarian is important is in the enforcement of Grade A milk regulations. This is an area in which there probably has been more misunderstandings due to a lack of communication between county extension agents and sanitarians than in any other. This difference of opinion has largely been the result of a failure on the part of both Agricultural Extension and regulatory agency to communicate to the other the objectives of their respective programs. There is no question that the high sanitation standards set by regulatory agencies for the production of fluid milk have resulted in substantial economic and social gains to the dairy producer. There are doubtless individual exceptions to this and there are many who have been forced out of the dairy business due to an inability to comply with sanitary regulations. But largely these are persons who, for one reason or another, might more profitably have been engaged in some other agricultural enterprise. Occasionally, a county extension agent has taken exception to the enforcement of sanitary regulations, particularly in an area where such regulations were being introduced for the first time. There are very few instances, however, where a county extension agent was contacted by regulatory agency personnel in advance and where the objectives of the program were carefully explained where cooperation was not afforded. Remember that the county extension agent has a responsibility to the public which he serves and this includes opposing any program which he feels is not in the best interests of this public. If he hears only one side of the story, the farmers' side, he cannot be expected to take an objective attitude.

On the other hand, it could be considered the duty of the county extension agent to point out to the sanitarian where it appears that the program might be improved. In 1953, Dr. J. C. Flake (2)



asked a number of dairy industry leaders several questions relative to dairy farm sanitation and inspection. One of these questions was, "Have sanitarians stressed barn and milk house construction at the expense of producer methods to the point that it is time to re-emphasize basic methods?" Of the persons answering this question 69 percent answered in the affirmative, including 64 percent of those who were working directly with farmers. While this condition has improved considerably since 1953, the one single criticism of milk sanitation programs that is heard most often from county extension agents is the fact that correction of seemingly small faults is emphasized rather than the correction of basic sanitary faults. It is the responsibility of the county extension agent to call these things to the attention of the sanitarian and it is the responsibility of the sanitarian to either justify the requirement and the method of enforcement or, if he is at fault, to see that the method of enforcement is corrected. This is not to say that sanitation requirements that may seem non-essential to the uninformed are not necessary but rather that the sanitarian must spend more time explaining to his public or his clientele the reasons for these requirements. The county extension agent should most certainly be included among this "clientele." In turn, the informed extension agent can explain the reason for specific requirements to those farmers with whom he comes in contact or who ask about them.

While cooperation on the local level may be achieved without great difficulty, there is occasionally a lack of communication or understanding on the state or national level. It is important that there be an opportunity for exchange of views and an understanding of objectives at these higher levels, not only between specialists from both agencies but

also between administrators. Attitudes at the state and national levels are often reflected in attitudes at the local level.

In summary, the county extension agent and the county sanitarian have basically the same objectives, to serve the public. Each arrives at his goal by somewhat different means, one by education, the other by education and service plus law enforcement. The fact, however, that each may travel a different route should not be an excuse for non-cooperation. Education and enforcement are not incompatible but rather are necessarily complementary.

Misunderstandings and differences are more often due to a lack of communication than to any real differences in goals. To quote from an article in a recent issue of the *Journal of Milk and Food Technology* (3), "We should strive for a good, cooperative relationship with all of the agencies with which we come in contact. It is a good policy to call occasionally at the office of heads of various agencies with whom you deal. In addition to official reports, talk over a problem with them. Ask their opinion on a subject. Their response often will prevent their building up passive resistance to programs you are attempting to carry out. By all means, report to them good things about their agency as well as the bad." Local sanitarians might profitably include the county Agricultural Extension Service among those agencies with which they deal.

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## CHEMICAL RESIDUES IN FOOD – A GOOD WORD FOR MILK<sup>1</sup>

FRANK V. KOSIKOWSKI

*New York State College of Agriculture  
Cornell University, Ithaca, New York*

The situation regarding chemical residues in our country's milk supply is perhaps the most favorable for a number of years. Good control has been achieved over the incidence and concentration of antibiotic residues, levels of pesticides in milk have been reduced, and although radionuclides in food are related partly to bomb testing, nevertheless, our expanding monitoring system, which is keeping us well informed, indicates no cause for alarm. Despite all the past clamor, the milk supplies of the U. S. A. are among the purest and safest in the world now or at any period of time in the history of mankind.

Chemicals in food are a phenomenon of the Twentieth Century. The vital need for more and more diverse food in a world rapidly filling all the open spaces with new faces and stomachs has created one of the major controversies and contradictions of our time. It reflects the fact that the over-all safety of food and milk from disease organisms has, with the assistance of sanitarians, improved to such an astounding degree in past decades that attention now can be turned toward chemical contaminations.

No country in the world today produces foods absolutely free of chemical residues and no food available to man is absolutely free of residues. Only the nature and level of these residues and their potential long-term effects on man are not fully known.

### *Gross Contaminants of Food*

Gross chemical contamination, arising because of ignorance, carelessness, and deliberate intent to defraud, represents an infrequent but acute danger to the consumer. A few recent examples are cited here.

Several years ago in Holland, oleomargarine with a new type emulsifier was sold to customers. Between 50,000 and 75,000 Dutchmen became violently ill from this oleomargarine and a small number died. A new emulsifier not fully tested, reportedly, was the cause, and the Dutch government forbade the sale of oleomargarine. This is an example of the ignorant use of chemicals.

Again, about 1956 in Morocco, unscrupulous natives purchased surplus airplane jet engine oil from nearby American air bases and deliberately diluted edible olive oil with it. This adulterated food was sold to unsuspecting consumers. Harmful chemicals in the jet oil permanently paralyzed and blinded over 10,000 Moroccans. The United States is still send-

ing medical mercy teams to ease the plight of these unfortunates. A case of deliberate intent to defraud which backfired with tragic consequences.

Such gross contaminations of foods are not the unique prerogative of overseas countries. For example a newspaper story, date lined January 5, 1962, states: "The United States Food and Drug Administration today warns the public to be careful of a potato bleaching compound in which a deadly poison, sodium fluosilicate, was accidentally substituted for the compound, sodium bisulfate. The product is known to be scattered over the country and a nationwide effort to locate and recall all stocks of the contaminated product is under way." An example of carelessness.

Present food distribution is on such a massive nationwide scale that one serious mistake can result in many casualties before the foods are recalled. Caution then should prevail when a food is produced, compounded, or processed. Poisonous chemicals, as rat poison, fly sprays, and certain sanitizers and disinfectants should never be stored in the same stockroom with harmless edible components, and no new food components, however apparently harmless, should ever be added to a food without prior pilot plant and feeding tests and without the approval of the responsible health authorities. The recent case in Binghamton, New York, where salt was substituted for sugar in infant formulae with six deaths resulting, is a good reminder of potential tragic consequences.

Incipient chemical residue buildup in milk and food, in contrast to gross contamination, originates from three major sources: pharmaceutical drugs, pesticides, and radioactive fallout.

### *Pharmaceutical Antibiotics*

Since 1948 about 7% of the bottled milks in the world showed traces of pharmaceutical antibiotics resulting from drug infusions into the animal.

In 1959 the medical profession professed to see a public health danger in milk containing traces of penicillin. This view, not particularly well documented by scientific evidence, was nevertheless accepted at face value by responsible enforcement officials.

Milk has always received special consideration with regard to chemical residues because it is the basic food of infants. A number of foods have tolerance for antibiotic residues, but milk traditionally has none.

<sup>1</sup>Presented in part at Agricultural Progress Days Symposium, Trenton, New Jersey, January, 1962.

During the acute reappraisal period of 1959, the situation became so extremely critical as to indicate possible loss of consumer confidence in milk. Consideration was given to abandoning penicillin as a therapeutic aid for cattle disease, but such a decision would have been a calamity because long range efforts to eradicate mastitis would be adversely affected.

The dairy industry saw the writing on the wall, or at least in the advance notices of contemplated Federal action, and set about to correct a 10-year-old problem. Taking advantage of our new methods of detection, a wise philosophy of periodic testing of producers' milks was adopted with gratifying results.

Cornell University in 1960 collected test results of 45 state and industrial laboratories on over 750,000 milks (3). Only 0.5% of the milks showed detectable antibiotics indicating almost a fifteenfold decrease over the prior ten year average, an improvement confirmed by surveys elsewhere and maintained through 1961. For example, one large New York State dairy concern reported testing over 100,000 samples of milk last year with 0.27% incidence.

Fluid milk supplies in the United States are now practically free of antibiotic residues, a situation which places this country well ahead of others as the leader in the control of a world-wide problem. It has stimulated more consumer confidence in milk in this area while permitting continued use of penicillin to fight cattle disease.

Though milk presently is at its lowest antibiotic residue incidence and level, to achieve zero incidence as required by law, farmers must continue to withhold milk after treatment; commercial antibiotic preparations, particularly ointments which persist 72 hours or longer must be restricted; and more, not less, testing must be practiced.

#### *Pesticides in Milk*

Pesticide residues in milk and food originate from one of a hundred chemical sources and from such activities as the dusting of crops and forests, barn spraying, and weed control. D.D.T., D.D.E., lindane, chloradane, heptachlor, and Methoxychlor are among the important.

Pesticide residues are in foods, including milk, but at levels not likely to implicate them in any danger to the consumer.

Milk contains levels of pesticides well below the safe tolerance of 7-14 ppm D.D.T. established for fruits, vegetables, and fat in meat, but the incidence of pesticides in milk is considerably higher than the incidence of antibiotic residues.

Recent pesticide surveys reported on 4,000 evaporated milks by Dr. H. E. O. Heineman and Miller (2) during a 12-month period in 1960-61 show the following:

The pesticide, D.D.T., was the most prevalent pesticide. It appeared in 90% of the positive milk samples while Methoxychlor appeared only in 28% of the positives. Methoxychlor is stated to be the only pesticide misused by farmers through barn spraying as the sources of the other pesticides were often beyond the control of the dairy farmer.

The western part of the United States experienced the highest incidence and level and the northern the least, perhaps reflecting the emphasis on crop spraying. Pesticide incidence was highest in the summer.

A zero tolerance too exists for pesticides in milk, and the challenge for the future is to lower the present incidence. Careful barn spraying practices may help. The role of concentrated feeds in this problem should be more firmly established as some suspicion exists that feeds produced in one part of the country are a contributing factor in milk in another. Also, recommendations of various state services about proper use and application of pesticides on crops and the feeding of crops to animals should be followed.

#### *Radioisotopes in Milk*

A third group of chemical residues in milk and other foods, for which farmers have had no direct responsibility, includes the radionuclides, iodine<sup>131</sup>, cesium<sup>137</sup>, and strontium<sup>90</sup>.

Atomic test bombing of past years and of recent Russian origin has incited world-wide fear about the further contamination of foods and human tissue. Also, reactor accidents, past and future, are contributing to the apprehension of some. For example, in 1957 the No. 1 pile at Windscale, England, blew up and deposited much I<sup>131</sup> over many square feet of grass. Cows were not permitted in these pasture lands and much milk was destroyed. Such accidents, though infrequent, may occur and some advance plan of action should be formulated to take care of both cows and milk.

As I<sup>131</sup> has a relatively short half-life of eight days, the consequence of its presence in grass or milk is not extremely critical. The radioisotope of most concern is Sr<sup>90</sup> because it has a half-life of 28 years, tends to deposit itself in bone structure in association with calcium, and in later life may cause cancer. This is why constant checking is conducted on foods to ascertain present levels.

Calcium is required for bone and teeth, and milk and milk products in the United States provide 85% of our essential calcium needs. Accordingly, the affinity of Sr<sup>90</sup> for replacing calcium is of particular significance. Does this excellent food, milk, act as a concentrated source of Sr<sup>90</sup>? Actually, from controlled experiments it has been found that the cow screens out over 95% of the Sr<sup>90</sup> in the plant food ingested in her gut. Thus, compared to direct plant

food sources of calcium, milk provides calcium to the human with a far lower ratio of Sr<sup>90</sup> to Ca.

Dr. B. L. Larson (4, 5), a leading agricultural biochemist of the University of Illinois, has written two excellent reviews on this subject, which should be required reading. He lists evidence that the area of the world that receives its dietary calcium from milk and milk products deposits relatively lower levels of Sr<sup>90</sup> in the bones of the inhabitants than in those of people residing in the primarily vegetable and cereal-consuming areas of the world. Present levels of Sr<sup>90</sup> in plant foods, apparently, are well above those present in milk, so even though each plant source contributes a small proportion of the total food humans consume collectively, they are contributing far more Sr<sup>90</sup> to the diet than is milk. Furthermore, though our Northern Hemisphere has received more radioactive fallout than the Southern Hemisphere, the Sr<sup>90</sup> in the skeletons of deceased individuals in both hemispheres is about the same, an observation more than likely explained by the difference in dietary sources of calcium for individuals in the two hemispheres.

Dr. Larson states that persons who are concerned with fallout in food would be wiser to ingest more milk rather than less.

Newspapers have made much of the published assays of Sr<sup>90</sup> in milk but extensive analyses of milk have been conducted because of its easy sampling and because scientists were eager to study first the implications of the rich source of calcium in milk.

The amount of Sr<sup>90</sup> in milk in 1959 ranged from three to thirty micromicrocuries per liter of milk in the United States and is considered by experts to be a level requiring continued surveillance only.

*Minimizing Effect of Fallout in Milk.* In anticipation of increasing levels of Sr<sup>90</sup> in food if bomb testing is resumed on a large scale, the Federal Government has initiated an interesting pilot plant project calculated to remove most of the low level strontium contamination in milk. See *J. Milk and Food Technol.*, **25**:149.1962. This process passes acidified milk through a resin bed where an exchange of calcium takes place, simultaneously removing the associated strontium isotope up to 98%. The sanitary, nutritional, and economic aspects of the process with relation to fluid milk have not been com-

pletely appraised and these cannot be ignored or discounted. Commercial units, if needed, will not be available for many months.

*A Simple Emergency Food.* Not fully appreciated is the fact that other dairy products in their natural state are almost devoid of isotope residues even if made from purposely contaminated milk. For example, well washed butter made from milk infused with I<sup>131</sup> is 99.1% free of this isotope (6, 7). Also, experimentally thrice washed cream has 99% less strontium than the original milk (1).

No observations have been reported on uncreamed cottage cheese, but it can be predicted from the manner of manufacture of lactic acid cottage cheese that the levels of Sr<sup>90</sup> and other nuclides would be insignificant even if made from a contaminated milk. The required constant washing of this dairy product during regular manufacture under highly acid conditions should remove almost all of the isotopes.

Processing of such a nutritious, high-protein dairy food as creamed cottage cheese, using washed cream dressings, potentially free of isotopes and quickly available to the populace in an emergency, ought to be given consideration for emergency use. Only regular sanitary dairy equipment is required, no highly scientific skills are necessary for its preparation, and in a crisis availability would be a matter of hours.

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## PESTICIDE RESIDUES – A MEDICAL APPRAISAL<sup>1</sup>

M. R. ZAVON

*Kettering Laboratory, Cincinnati, Ohio*

New analytical procedures make it possible to detect pesticide residues in food at a fraction of the level previously detectable. The possibility exists that products formerly thought to have no residues will now be shown to have them. Fear has been voiced that pesticide residues may cause disease. If pesticide residues in food are shown to be more widespread than formerly believed, this fear of danger may be further stimulated. Investigations among the human population have failed to reveal any deleterious effects from pesticide residues in food. Nor is there any other positive evidence of effect on the human population resulting from pesticide residues. Analysis of mortality statistics tends to show many more likely reasons than the introduction of pesticides for changes in causes of death. There is no reliable evidence that the leading causes of death have been influenced by pesticide exposure in food or otherwise. Despite this absence of positive information there is no doubt that we need quantitative investigations to determine the actual exposure of the population to pesticide residues and long term, carefully controlled clinical investigations to determine whether or not injury actually occurs.

There has been developed recently a new analytical method which may well revolutionize the analysis of organic chemical residues in food (1). This new method, gas liquid chromatography with electron capture enables the analyst to detect dieldrin, for example, at a level of 0.0001 ppm (2). What is more he can make this analysis in one hour instead of the three days previously required. The introduction of such a powerful analytical tool reduces the concept of zero to an absurdity. What is a practical zero? What is the meaning of zero?

This question is asked because the current concept of protection of the public health requires that there shall be zero quantity of certain pesticides in our food. This requirement has been particularly vexing, as is well known, in connection with the production of milk but has also been a problem in meat production and has become a problem wherever cultivated crops requiring pesticide application are grown in close relationship to pasturage. What is the basis for the zero tolerance of pesticides in milk and the generally low tolerance limits in other foods?

As a general rule we wish to limit to the lowest amount possible the man-made chemicals in our daily diet. This rule is followed on the general premise that man has been able to adapt to natural

stresses over the millenia but that he may not have the ability to adapt to the stresses imposed by unusual quantities of naturally occurring inorganic materials or man-made organic materials. The validity of this generalization has never been tested on a population-wide basis but there has been sufficient confirmation of the general premise to accept its essential validity.

### THE ZERO TOLERANCE

As our analytical techniques become more acute the earlier zero becomes a finite number. The fact that zero today is a positive number tomorrow, requires that we fully understand that nothing has changed except our ability to measure. Measurement that is impossible below a 0.1 ppm today, and is therefore labeled zero, may become possible tomorrow and becomes 0.001 ppm instead of zero. The actual quantity of pesticide that is present remains the same.

### PESTICIDE CONCENTRATION IN THE HUMAN POPULATION

The most widely used pesticide is DDT. It has been used throughout the world for more than 15 years. There is no doubt that DDT is present as a residue on many crops and has been present as a residue for many years. The concentration of DDT in human fat has been shown to range from one to ten parts per million in the investigation reported by the Public Health Service (3). At this concentration no effect has ever been detected.

No pesticides are legally allowed in milk sold for human consumption. However, Lange (4) found 0.1 to 0.15 ppm of DDT in human milk without any known effect on the nursing child. Thus we have a situation in which the child nursing at his mother's breast may receive more DDT than the child raised on cow's milk.

Accusations are heard frequently that quantities of pesticides, such as described above, may result in harmful effects. Is there any evidence that the pesticide residues found in the American dietary has resulted in harm or may result in harm to the population?

### ANSWERS TO THE QUESTION

There are a number of ways in which we can look for an answer to our question. Each has been tried and found wanting in some respect but, neverthe-

<sup>1</sup>Presented at the 48th annual meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., in Des Moines, Iowa, August 14-17, 1961.

less, together they tend to give an answer which has the weight of all the available evidence.

#### *Animal Experimentation*

Before any pesticide is introduced into use it must undergo extensive testing on animals. Feeding experiments lasting as long as two years are required with many compounds. Though two years is a short period in the life span of a man, it is the major part of a lifetime of a rat and a very significant portion of the life span of the dog. Deleterious effects resulting from such feeding experiments rule out the material as a commercial possibility. Lack of effect in animals is no guarantee of lack of effect in humans but it is an indication; it is a direction signal.

#### *Observation of Human Subjects*

Human beings cannot be controlled in the same fashion in which we control experimental animals with the result that human observation is difficult, time consuming, and costly. Despite these handicaps several series of observations have been made on human populations and their exposure to pesticides.

A large number of persons exposed to lead arsenate either as consumers of fruit or workers in the orchards of Wenatchee, Washington, were examined by a team of Public Health Service personnel. No evidence was found that ill health was any more prevalent among the group exposed to the lead arsenate than among a similar group not so exposed. Nor was there evidence that any chronic disease had been caused or influenced by the exposure to the lead arsenate (5). There is underway at the present time an attempt to trace all of the people involved in that investigation of 25 years ago in order to gain additional information but such a job is obviously rather difficult.

Ortelee, reporting in 1958, found no correlation between prolonged, intensive occupational exposure to DDT and the frequency or distribution of clinical abnormalities (6). Hayes fed a diet containing a known quantity of DDT to a group of human volunteers and was unable to find any evidence of disease caused by the exposure to the pesticide despite the fact that the quantities of DDT were well in excess of that which might be found as a food residue (7).

Obviously, experiments of this type have not been used to screen all pesticides which might be found as residues in food. Those which have been done have produced uniformly negative results.

#### *Studies of Population Groups*

The statistical evaluation of reported illness and death offers yet another possible method of finding an answer to our original question. When large groups of the population are exposed to a new factor

in the environment this method of approach is often best for obtaining an indication of possible ill effects. Detailed clinical studies can then attempt to confirm or refute the suggestion obtained by analysis of vital statistics.

Investigation of the effect of pesticide residues by this method is tremendously complicated by the simultaneous introduction into our environment of innumerable other chemical, and physical agents. The problem is further complicated by the failure of official agencies to require the reporting of most illnesses and the changes in the official listing of causes of death during this Century. If we could show a significant difference in causes of death between 1900 and 1956, a difference which has some conceivable relationship to a change in the environment, we might then be able to design investigations to prove or disprove the validity of our assumption. Unfortunately, the difficulties in the way of such a comparison appear insurmountable.

#### STATISTICS EVALUATED

Admitting that we are unable to make a valid comparison, let us look at the 1956 statistics and attempt to evaluate some of the changes in cause of death that have occurred over the years.

The ten leading causes of death of white males in the United States in the year 1956 and the number per 100,000 population are as follows:

1. Diseases of the heart	443.0
2. Malignancy	162.5
3. Vascular lesions of central nervous system	102.3
4. Accidents	76.9
5. Certain diseases of early infancy	40.1
6. Influenza and pneumonia	29.5
7. General arteriosclerosis	19.6
8. Suicide	16.9
9. Cirrhosis of liver	14.7
10. Congenital malformations	13.7

Note that the first three categories are for types of disease usually, but not exclusively, associated with aging. The increase in life expectancy has been accompanied by an increase in the degenerative diseases to a position as a leading cause of death.

It is impossible to single out any simple reason for an increase in a particular cause of death. Probably the most valid reasons for the shift that has occurred in this Century is the greater age at time of death and the decrease in infectious disease. Simultaneously accidental death has become a serious problem. Though accidents are now the fourth greatest cause of death in the United States it is probable that in actual fact deaths per 100,000 of population due to this cause have actually decreased. We are unable to muster any reliable evidence that the leading causes of death have been influenced by pesticide

exposure in food or otherwise. For every shift in position of a particular cause of death there are a multitude of explanations most of them far more reasonable than the possible exposure to trace quantities of pesticides.

Malignancy is now the number two cause of death. If an item of diet were the cause of an actual increase in malignancy we would expect the increment to be divided equally between the sexes. We are aware that smoking habits differ between men and women but there is no obvious difference in types of food intake. Changes in the mortality from different types of malignancy have not been divided equally between the sexes. In some instances in recent years cancer mortality rates have decreased but by-and-large any changes in mortality rates are attributable to improved diagnosis and treatment. One exception to the previous statement should be noted. It is difficult to get comparable figures but it appears reasonably certain that there has been an absolute increase in leukemia since the turn of the century. At present there is considerable feeling that this increase is partially due to the increase in radiation exposure of much of the population. We have no evidence that other environmental factors have the same leukemogenic potentiality as ionizing radiation.

Illness is not reportable except for a number of specific diseases. The data available is insufficient to even attempt to correlate morbidity with changes in the chemicals available in the diet.

#### CAUSE AND EFFECT

Though each of the methods of approach which have been described has been found wanting in some respect, in the aggregate they offer no positive evidence that pesticide residues have caused any deleterious effect on the health of our population. To conclude that pesticide residues have resulted in disease, as has been frequently stated, calls for more evidence than presently exists.

Before we can design an experiment which will attempt to answer the question there are a number of preliminary questions which must first be answered.

1. How much pesticide residue is there in food?
2. What chemical form do these residues take?
3. How much of the residue is present after food preparation?
4. How much of the residue is ingested?
5. How much of the residue is excreted unmetabolized without effect?
6. How much of the residue remains in the human body?

The answer to question one is known. As we proceed down the list our knowledge becomes more and more fragmentary, yet if we wish to determine

whether or not pesticide residues cause harm to people we must have some idea of how much they actually ingest, how much they retain, and what happens to the material in the body. Too much of the discussion of the effects of pesticides residues has proceeded on the assumption that the amount found on the farm or in the meat market or produce dealers shelf is the amount actually ingested. Food preparation may markedly alter the amount of residue. Habits of food intake may also affect the intake of pesticide residues. Pesticides which are primarily deposited in the fat may be ingested by the person who eats the fat on meat but would barely be touched by the person who trims away all visible fat.

In order to develop good clinical data we should set up two population groups. One group would consist of people with an aversion for fat and a second group would consist of people who eat the fat. We would have to insure that most other factors were identical and we would want analyses of duplicate samples of all food and drink in order to know exactly what the exposure has been. Of course we would have to analyze all excreta in order to gain an idea of how much pesticide has remained in the body. Following these two population groups for a period of a least 20 years might give us conclusive data. Assuming that new information during that interval didn't invalidate our assumptions and methodology, we might by diligent clinical and laboratory examination determine whether or not pesticide residues had an effect. This approach is much more difficult than ex cathedra statements without a basis in controlled observation or experiment. Yet, we cannot be stampeded into ill considered action by baseless hysterical statements.

In 1958 the Food and Drug Administration, after consultation with an advisory committee, ruled that no tolerance would be allowed for methoxychlor in milk and has since followed the rule that no tolerances would be allowed for pesticides in milk. The basis for this ruling was the unique place milk supposedly holds in the diet of certain groups of our population. In the present diet of the United States it might be questioned how unique a place milk actually occupies. It is questionable whether any group of the population, child or adult, now has an exclusive diet of milk for any prolonged period of time. Recognizing this, a more recent advisory group has reversed the earlier recommendation and has recommended that tolerances for pesticides in milk can be safely established.

In the light of all available evidence we must make judgements regarding our environment. If we are swayed by hysteria and the desire to return to the "good old days" of tetanus, diphtheria, wormy

apples, summer diarrhea, and swarms of flies in every household, we can take the approach that we do not wish to have pesticides in our environment and we do not want any pesticide residues in our food. If we wish to have the comforts, conveniences, and good health associated with today's standard of living we may have to accept some residue of pesticides in our food. We can, however, reassure ourselves with the knowledge that there is at present no evidence that such residues have caused or will cause any deleterious effects on the human population.

#### CONCLUSIONS

1. No deleterious effect has been shown to result from pesticide residues in our food.
2. It should be possible to establish safe residue limits for all foods.
3. Quantitative investigations to determine the actual exposure of the human organism to pesticide residues would be highly desirable.

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# NOTICE

## Program and Reservation Cards

For the

### 49th ANNUAL MEETING

OCTOBER 24, 25, 26, 27, 1962

Ben Franklin Hotel

Philadelphia, Pa.

WILL BE IN THE AUGUST ISSUE



### 3-A SANITARY STANDARDS FOR FILLERS AND SEALERS OF SINGLE SERVICE CONTAINERS FOR MILK AND FLUID MILK PRODUCTS

Serial #1700

*Formulated by*

*International Association of Milk and Food Sanitarians*

*U. S. Public Health Service*

*The Dairy Industry Committee*

It is the purpose of the IAMFS, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments Single Service Container Filler and Sealer specifications heretofore or hereafter developed which so differ in design, material, fabrication, or otherwise as not to conform with the following standard, but which, in the fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFS, USPHS, and DIC, at any time.

#### A. SCOPE

These standards cover the sanitary aspects of equipment for performing the functions of mechanically opening, filling and sealing single service containers and all parts which are essential to these functions. It does not pertain to other integral equipment embodied on certain machines which perform such functions as container fabricating; nor to the single service container.

In order to conform with these 3-A Sanitary Standards, Fillers And Sealers Of Single Service Containers For Milk And Fluid Milk Products shall comply with the following design, material, and fabrication criteria.

#### B. DEFINITIONS

For the purpose of these standards, the following definitions shall apply:

(1) *PRODUCT*: Shall mean the milk or fluid milk product which is filled and sealed into the container.

(2) *CONTAINER*: Shall mean a single service package capable of holding milk or fluid milk products.

(3) *MECHANICAL OPENING EQUIPMENT*: Shall mean the equipment for opening a container without manual contact with any product contact surface of the container.

(4) *MECHANICAL FILLING EQUIPMENT*: Shall mean the equipment for mechanically filling an opened container with the product.

(5) *MECHANICAL SEALING EQUIPMENT*: Shall mean the equipment for mechanically closing and sealing an opened, filled container.

#### (6) SURFACES:

(a) *Product Contact Surfaces*: Shall mean all surfaces which are exposed to the product, surfaces from which liquids may drain, drop or be drawn into the product or into the container, and surfaces that touch product contact surfaces of the container.

(b) *Non-Product Contact Surfaces*: Shall mean all other surfaces.

#### C. MATERIAL

(1) All product contact surfaces shall be of 18-8 stainless steel of not more than 0.12% carbon, nickel alloy or equally corrosion-resistant metal that is non-toxic and non-absorbent, except that:

(a) Those surfaces of container opening, closing and sealing devices which touch the product contact surfaces of the container, or from which liquids may drain or drop into the container, may be plated with a corrosion-resistant, non-toxic, non-absorbent metal.

(b) Plastic materials may be used for filling nozzles, plungers, gaskets, diaphragms, sealing rings, drip shield, container opening and closing parts, filling valve members, and parts used in similar applications. These materials shall be relatively inert, resistant to scratching, scoring and distortion by the temperature, chemicals and methods to which they are normally subjected in operation, or cleaning and bactericidal treatment. They shall be non-toxic, fat resistant, relatively non-absorbent, relatively insoluble, and shall not release component chemicals nor impart a flavor to the product.

(c) Rubber and rubber-like materials may be used for filling nozzles, plungers, gaskets, diaphragms, sealing rings, drip shields, container opening and closing parts, filling valve members, seals and parts used in similar applications. These materials

shall be relatively inert, resistant to scratching, scoring and distortion by the temperature, chemicals and methods to which they are normally subjected in operation, or cleaning and bactericidal treatment. They shall be non-toxic, fat resistant, relatively non-absorbent, relatively insoluble, and shall not release component chemicals nor impart a flavor to the product.

(d) Sanitary single service gaskets may be used.

(2) All non-product contact surfaces shall be of corrosion-resistant material, shall be rendered corrosion resistant, or shall be painted. Surfaces to be painted shall be effectively prepared for painting and the paint used shall adhere, be relatively non-absorbent, and shall provide a smooth, cleanable and durable surface. Parts having both product contact and non-product contact surfaces shall not be painted.

#### D. FABRICATION:

(1) All product contact surfaces shall be at least as smooth as a No. 4 mill finish, or 120 grit finish properly applied.

(2) All permanent joints in product contact surfaces shall be welded or silver-alloy brazed.

(3) All product contact surfaces shall be easily accessible, visible, and readily cleanable, either when in an assembled position or when removed. Removeable parts shall be readily demountable.

(4) All product contact surfaces shall be self-draining or self-purging except for normal clingage. The bottom of the filler bowl shall have a minimum pitch of 1/8" per foot toward the plane of the outlets.

(5) The filler bowl shall be equipped with a cover having a drop-flange which overlaps the rim of the bowl by at least 3/8". All openings in the bowl cover shall have raised rims or flanges of at least 3/8", and such openings shall be provided with covers having a downward flange of not less than 1/4" so designed as to prevent liquid from entering the product zone. Covers shall be self-draining.

(6) The filling equipment shall be so designed that adjustments necessary during the operation may be made without raising or removing the filler bowl covers.

(7) All internal angles of 135° or less on product contact surfaces shall have minimum radii of 1/4" except where smaller radii are required for essential functional reasons, such as filler nozzles and ring seal grooves. In no case shall such radii be less than 1/32".

(8) Shields or guards shall be provided and shall be so designed and located to prevent liquid or other contaminants from draining or dropping into the

container or product, or onto product contact surfaces.

(9) All sanitary pipe fittings shall conform with 3-A "Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products," and Supplements thereto.

(10) Any coil spring having product contact surfaces shall have at least 3/32" openings between coils, including the ends.

(11) Non-product contact surfaces shall have a smooth finish, be free of pockets and crevices, and readily cleanable.

(12) Legs shall be of sufficient length to provide at least 6" clearance between the lowest fixed point of the machine and the floor, and shall be smooth with rounded ends and have no exposed threads. If legs are of hollow tube stock, they shall be effectively sealed. Fillers which are portable may be equipped with casters.

(13) *DEFOAMER SYSTEMS*: If defoamers are used they shall conform to one or more of the following:

(a) Steam defoamer systems shall be provided with a suitable self-draining water condensation trap and strainer on the steam supply line just prior to the defoamer head. Defoamer head shall be constructed in conformance with D.(3), above. (See APPENDIX "A" for suggested design of water condensation trap and strainer, and recommendations.)

(b) A vacuum system designed to return foam continuously to the filler bowl. In this type all surfaces from which foam may drain, drop or be drawn into the product shall be constructed in conformance with D.(3), above.

All surfaces of blower or vacuum lines subject to contact with foam shall be constructed in such a manner as to be readily accessible for cleaning. (See APPENDIX "B" for suggested design.)

(c) A vacuum system design not to return foam to the filler bowl. In this type all surfaces from which foam may drain, drop or be drawn into the product or the sanitary container shall conform with D.(3), above.

All surfaces of blower or vacuum lines subject to contact with foam shall be constructed in such a manner as to be readily accessible for cleaning. (See APPENDIX "C" for suggested design and recommended operation.)

This system shall be incorporated only in machines having gravity type fillers.

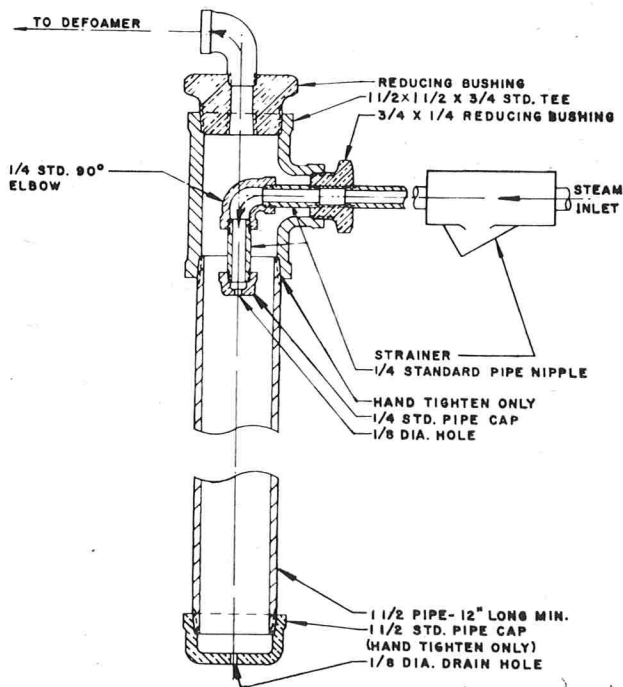
**HANDLING OF COLLECTED MILK:**

If the milk or milk product collected in this system is intended to be used for human consumption the following procedures are recommended:

- (1) It should be protected from contamination during collection and in subsequent handling.
- (2) It should be maintained at or below the legal temperature requirement for milk for pasteurization.
- (3) It should be repasteurized.

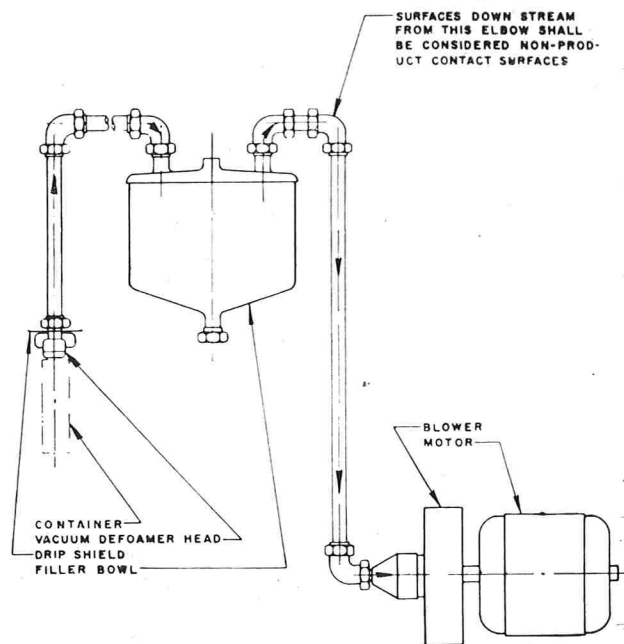
These standards shall become effective October 17, 1962.

**APPENDIX "A"**  
**SELF DRAINING WATER CONDENSATION TRAP**



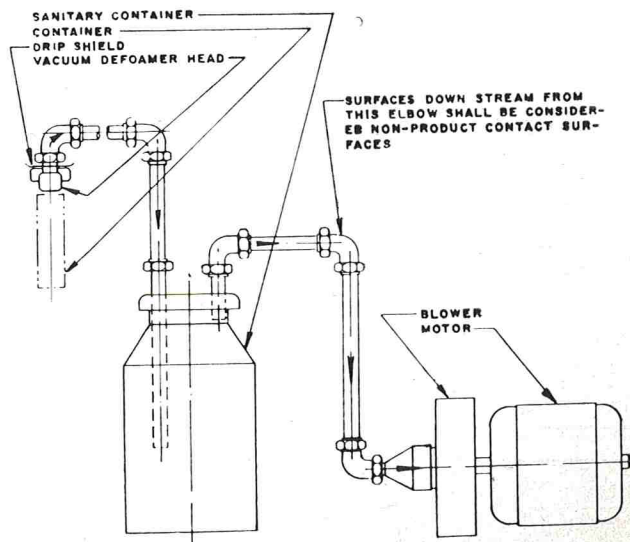
NOTE: It is recommended that this assembly be fabricated of corrosion-resistant material.

**APPENDIX "B"**  
**VACUUM DEFOAMER SYSTEM**  
**CONTINUOUS RETURN TYPE D.(13) (b)**



NOTE: This entire assembly, including blower, should be cleaned after each day's operation.

**APPENDIX "C"**  
**VACUUM DEFOAMER SYSTEM**  
**NON-RETURN TYPE D.(13) (c)**



NOTE: This entire assembly, including blower, should be cleaned after each day's operation.

# A PROCEDURE FOR THE BACTERIOLOGICAL EXAMINATION OF POTATO FLAKES

JOHN C. KISSINGER

*Eastern Utilization Research and Development Division, Agricultural Research Service,  
U. S. Department of Agriculture, Philadelphia, Pennsylvania*

This paper describes a simple, economical, and reproducible procedure developed at the Eastern Utilization Research and Development Division, U. S. Department of Agriculture, for microbiological testing of dehydrated mashed potato flakes.

## DESCRIPTION OF PROCEDURE

### Equipment Required

1. Milk dilution bottles, (1) 99 ml size.
2. Bacteriological can opener<sup>1</sup> or scissors, depending upon the type of package used for the product.
3. Pipettes: 11.0-ml milk pipettes (1).
4. Waring<sup>2</sup> blender, single speed, 15,000 r.p.m.
5. Waring blender cups with crew-cap lids or Mason jars modified by fitting Waring blender knives into the jar lid.
6. Petri dishes: 100 mm. x 15 mm.
7. Metal cans for pipettes and Petri dishes.
8. Erlenmeyer flasks: 750 ml and 1500 ml for media.

### Dilution Water and Culture Medium

#### Phosphate Buffered Dilution Water (1)

1. Stock Solution
  - a. Dissolve 34 g of  $\text{KH}_2\text{PO}_4$  in 500 ml of distilled water.
  - b. Adjust to pH 7.2 with 1N NaOH.
  - c. Make up volume to 1 liter with distilled water.
2. Add 1.25 ml of the above solution to distilled water and make up to 1 liter for dispensing in dilution bottles.

#### Tryptone Glucose Extract Agar (2)

- |                    |           |
|--------------------|-----------|
| 1. Beef Extract    | - 3 g     |
| 2. Tryptone        | - 5 g     |
| 3. Dextrose        | - 1 g     |
| 4. Agar            | - 15 g    |
| 5. Distilled water | - 1 liter |

### Testing Method

1. Prepare sterile dilution blanks with phosphate buffered dilution water. Sufficient water should be placed in the Waring blender cups to permit thorough

blending of a 1:15 dilution of the product, e.g., 20 g of product + 280 ml of dilution water. Subsequent dilutions should be made in the 99-ml milk dilution bottles.

2. Using aseptic precautions, weigh out a sufficient amount of product to prepare a 1:15 dilution directly into the Waring blender cup.

3. Permit the product to rehydrate for 5 minutes with occasional agitation to prevent localized caking.

4. Blend for 2 minutes at 15,000 rpm.

5. Using aseptic precautions immediately pipette 1-ml portions of the 1:15 dilution into each of three Petri dishes.

6. Make a further dilution of 1:150 in a sterile phosphate-buffered water blank by adding 11 ml of the 1:15 dilution to the blank containing 99 ml of dilution water.

7. Shake the 1:150 dilution bottle vigorously to ensure good dispersion of the inoculum and immediately pipette 1-ml aliquots aseptically into each of three Petri dishes.

8. Add approximately 15 ml of tryptone glucose extract agar that has been melted and cooled to approximately 45°C to each Petri dish and disperse the inoculum by gentle rotation of the dish.

9. After the agar has solidified, pour an overlay of tryptone glucose extract agar on each Petri dish.

10. Incubate Petri dishes at 32° C for 48 hours to secure the colony count for mesophilic organisms. If the colony count for thermophilic organisms is desired, incubate a duplicate series of plates at 55° C for 48 hours.

11. Control plates should be prepared for each incubation temperature.

## DISCUSSION

Use of the standard, commercial type of blender cup is recommended; but it is possible to substitute Mason jars with blender knives fitted into the caps for blender cups. The knives must be fixed securely in the center of the jar lid so that no leakage will occur. The knife blades should be bent slightly upward to permit easy, rapid opening and closing of the container during aseptic operations. If a large sampling program is anticipated, it would be advisable to construct a holder which would keep the blender jar securely in position during blending.

<sup>1</sup>This instrument is also known as the "special can opener" used for can break-down studies in the canning industry.

<sup>2</sup>Reference to certain products or companies does not imply an endorsement by the U. S. Department of Agriculture over others not mentioned.

A ring stand equipped with a large, adjustable clamp or a spring clamp work well for this purpose.

The suggested dilutions and blend times were worked out in the laboratory. In general, the counts on commercial potato flakes can be derived easily from a 1:15 dilution of the product. Samples of commercial flakes examined at the Eastern Utilization Research and Development Division have usually shown counts of less than 2,000 colonies per g. A bacterial population of this magnitude can be counted easily by plating the suggested dilutions. The 2-minute blend time is most important in this procedure. Blending a 1:15 dilution of potato flakes for less than 2 minutes tends to produce plates that are difficult to count, because large numbers of poorly blended flake particles make colony counting confusing. It was found that the 2-minute blend time was optimum because the plates made from 2-minute blend material had a minimum of large particles and showed the highest counts. While blending for less than 2 minutes led to difficulties in counting the plates, blending for longer periods produced lower counts, because heat generated during blending was sufficient to partially pasteurize the blend. In the course of establishing the 2-minute blend time, commercial potato flakes and flakes produced in the pilot plant were blended for time intervals of 1.0, 1.5, 2.0, 3.0, 5.0, and 7.0 minutes. None of the plates made from blends of less than 2 minutes duration were satisfactory, because they were clouded by poorly macerated flake particles. Blending for 2 minutes or longer gave a slurry which contained few large flake fragments, and plates made from these blends were much easier to read. However, blending for more than 2 minutes produced counts that were lower than the count derived from the 2-minute blend. Hence, 2 minutes was selected as the optimum blend time which would produce the highest colony counts on plates which were not partially obscured by flake fragments. While considerable variation was found in the decrease in colony count of various commercial samples with increased blending time, the addition of each blend time increment above 2 minutes always showed an attendant decline in colony count. The average percentage decrease in colony count with the increase of blend time noted in this work is shown in Figure 1.

These figures were secured mainly from commercial samples of undetermined age. An industrial laboratory working solely on fresh material might find some variation in rate of decline in count from this pattern due to the presence of more vegetative cells; but work done on flakes produced in the Eastern Utilization Research and Development Division pilot

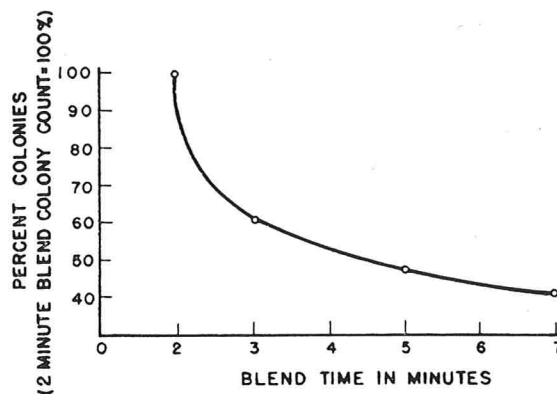


Figure 1. Survival of bacteria in dried potato products during blending.

plant indicates that the 2-minute blend time at 15,000 rpm is the optimum for flake samples regardless of age.

Care must be exercised to make certain that the inoculum is evenly mixed with the medium. Inadequate dispersal of the inoculum will produce plates which are crowded with colonies in the areas occupied by the inoculum. Plates of this type are difficult to read and lead to erroneous results.

The application of an agar overlay on all plates is most important. Many of the organisms found in the products examined produced rapidly growing "spreader" colonies. These colonies frequently cover the entire surface of a Petri dish in the course of incubation, rendering the plate useless for colony counting. The use of the agar overlay acts as a deterrent to the activity of these organisms. In addition to this, the use of triplicate plates for any dilution decreases the possibility of losing a dilution series for counting purposes due to "spreader" organisms. One, or even two, plates in a series may be lost due to these organisms; but it is seldom that all three plates would be obscured by "spreaders."

Experience in this laboratory indicates that commercial flakes usually have a count of 2,000 colonies per g or less. Some exceptional samples have had counts below 500 colonies per g. No bacteriological standards are available for this product, at present; but it is felt that the use of the bacterial colony count can serve as a valuable tool in a plant sanitation and quality control program. The aforementioned count could serve as a reference point for starting such a program.

#### SUMMARY

A procedure for the bacteriological evaluation of potato flakes is presented in this paper. Equipment,

culture medium, diluent, and a step-by-step testing procedure are given. In addition, equipment modifications, selection of processing time, and precautions required for the successful performance of the test are discussed.

## REFERENCES

1. American Public Health Association, Inc. 1953. *Standard Methods for the Examination of Dairy Products*, 11th Ed. p. 95.
2. Difco Laboratories, Inc. 1953. *Difco Manual*, 9th Ed. p. 57.

## NEWS AND EVENTS

### MEET OUR PRESIDENT



Mr. Charles E. Walton is Health Officer and Sanitarian for the city of Laramie, Wyoming. He was graduated from the Greeley, Kansas High School and attended Parsons Junior College, Parsons, Kansas. His occupational background has provided him with a varied and broad experience, including four years with the Wichita Beacon Newspapers, Wichita, Kansas; six years with Fairmont Foods at Dodge City, Kansas where his responsibilities included supervision of the Grade A milk supply; two years of Navy service during World War II; Plant Superintendent of the Model Dairy Co., Pueblo, Colorado; and part owner of the Arapahoe Creamery in Pueblo. In 1950 Mr. Walton was appointed Sanitarian for the Health Department, Pueblo, Colorado and in 1952 when the City and County formed a joint unit he was appointed Chief Sanitarian. Later he became Chief of the Milk, Food, and Drug Section of the Department. In 1957 he left Pueblo for his present position in Laramie.

Mr. Walton is active in professional societies and community activities. He is a member and Past President of the Rocky Mountain Association of Milk

and Food Sanitarians; member and Past President of the Colorado Dairy Technology Society; and member of the American Legion and Veterans of Foreign Wars.

The Waltons have eight children among which are a son and daughter at the University of Wyoming and a daughter in nurses training at Wichita, Kansas.

### DATE SET FOR NEW YORK ASSOCIATION CONFERENCE

The dates of the 1962 Joint Conference of the Cornell Dairy Industry Conference and the New York State Association of Milk Sanitarians are September 24-26, 1962. The meetings will be held in Niagara Falls, New York at the Hotel Niagara.

The following Cornell University staff members will be presenting papers: R. D. Aplin, Dept. of Agricultural Economics; B. L. Herrington, Dept. of Dairy and Food Science; J. K. Loosli, Dept. of Animal Husbandry; J. C. White, Dept. of Dairy and Food Science and P. J. VanDemark, Dept. of Dairy and Food Science.

Also on the program will be: Alec Bradfield, Dept. of Animal and Dairy Husbandry, Univ. of Vermont; L. C. Thomsen, Dept. of Dairy and Food Industries, Univ. of Wisconsin; F. W. Lengemann, Atomic Energy Commission, Washington, D. C.; H. J. Barnum, Dairy Products Improvement Institute and Darold Taylor, U. S. Public Health Service, Washington, D. C.

### OLSON TO PRESENT PAPER IN NETHERLANDS

Dr. J. C. Olson, professor of dairy bacteriology at the University of Minnesota, and *Associate Editor of the Journal* will participate as a guest lecturer at an international meeting of animal production specialists in Wageningen, The Netherlands, on September 1.

His paper, "Hygienic Aspects of Milk and Payment for Quality," will be given during a special course on "Organization and Evaluation of Animal

Production in Larger Areas." The course—scheduled for August 27-September 8—will be sponsored by the International Agricultural Center under the auspices of the North Atlantic Treaty Organization.

Olson's research and teaching activity is in the field of microbiology as related to the production, processing and distribution of milk and dairy products. He is co-author of the textbook, "Dairy Microbiology." In 1951 he received the Outstanding Achievement Award of the Minnesota Sanitarians Association.

### FDA ISSUES BOOK ON PRINCIPLES OF FOOD SANITATION

A reprint just issued by the Food and Drug Administration is entitled "General Principles of Food Sanitation". It consists of the first two chapters of a technical bulletin entitled "Microscopic-Analytical Methods of Food and Drug Control". This entire publication is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. The price is \$2.00.

The reprint, which can be secured on request to the Department of Public Information, Food and Drug Administration, Washington 25, D. C., attempts to show *the place of sanitation in good commercial production and to outline the general principles of factory and product control*. FDA states that it can assist administrative and sanitation personnel in understanding basic concepts of plant sanitation, rather than delving into all of its specific aspects.

The remaining chapters of the full 255-page technical bulletin deal with laboratory applications of microscopic analyses to industry and regulatory problems. The chapters cover (1) isolation and detection of contaminants; (2) applied histology of food and drug materials; (3) chemical microscopy; and many other similar procedures.

### NEW DEVELOPMENT ANNOUNCED FOR REMOVAL OF RADIOACTIVITY IN FOODS

*A device for removing radioactive contamination, including Strontium 90, from milk* has been developed by a chemist at the Polytechnic Institute of Brooklyn. It was described and demonstrated to the press last week.

The device involves an electro-dialytic process which displaces up to 90 percent of radioactive ions such as Strontium 90 and Cesium 137 from liquid foods efficiently and economically. It can also be applied to the removal of iodine 131, according to its developer, Dr. Harry P. Gregor.

It is claimed that the method can be adapted for operation in either small or large milk processing plants in either a continuous or batch process and

that the cost to the processor, "estimated on a conservative basis," is one-half cent per quart. This figure is substantially under the Government estimate of 10c per quart for its ion-exchange removal process, but recent information indicates that the ion-exchange process on a commercial scale might finally work out to a much lower cost per unit—possibly 1c or 2c a quart.

The Gregor method involves the use of cation-permeable membranes, or membranes which will allow only positively charged ions to flow through. Since the plastic membranes act as a barrier to all but the positively charged ions, including SR 90 and CS 137, the nutrient values of the milk are unchanged, according to reports.

A major factor claimed for the efficacy of these membranes is their extremely small pore diameters which make them permeable only to simple inorganic cations such as are found in long-lived and particularly dangerous radioactive metals such as Sr 90 and Cesium 137. They are virtually impermeable to even low molecular weight sugars and other materials of biological origin. "Thus, one can displace the cations from milk without altering its food value," Dr. Gregor says.

Dr. Gregor has demonstrated his method to the Department of Agriculture. We understand that USDA felt the process worked very well on the small scale of the demonstration. However, the scientists at the Department have not seen enough to endorse the method as practical for commercial use. They also have some questions as to whether milk protein might not block up the small pores of the membrane.

The Gregor device consists of two basic compartments, the milk compartment and the "salt" compartment. As the contaminated milk is passed through the membranes separating the compartments the radioactive materials are drawn into the "salt" compartment by an electric current. The process can operate without current by simple diffusion but this process is a slow one. The electric current imposed greatly accelerates the transfer of the cations into and out of the milk compartment.

It was demonstrated that 60% of the Strontium-90 content of milk could be removed readily without acidification, and with acidification, 90% was removed. In essence, a cation-permeable membrane is a plastic film which contains a high concentration of fixed sulfonic acid groups. It is permeable essentially only to cations. Since its sole function is to act as a barrier, the membrane never requires regeneration and has a useful life of several years. Membranes differ from the comparable cation-exchange resins in that they are non-swelling and have an extremely fine pore structure.

In this process, there is spontaneous diffusion-ex-

change across the membrane of cations in the "milk" compartment with those in the salt or "sink" compartments. If a solution having the cationic composition of milk is passed through the "sink" compartment and milk is circulated through the other, exchange of cations across the membranes will result in the removal of Strontium-90 from the milk into the sink compartment. The imposition of a field and the passage of direct current in either direction greatly accelerates the transfer of cations into and out of the milk compartment. In order to remove 90% of the Strontium-90 content in milk, a batch process would require a sink containing approximately ten times the cationic content of the milk itself.

The working life of a membrane in this process is estimated to be at least three years and probably five years. Cation-permeable membranes permit the use of vigorous sterilization procedures.

Dr. Gregor says that the ion exchange process as devised by the Department of Agriculture calls for the addition of citric acid to lower the pH to cause increased dissociation of the various strontium complexes formed in the milk. In milk, approximately half of the strontium is bound in this fashion at normal pH levels. With the membrane process, according to Dr. Gregor, it is not necessary to use relatively expensive citric acid but rather an acid sink solution can be employed. This replaces certain of the cations in milk with hydrogen ions and thereby controls its pH without the need of direct acid addition. Since the ratio of inorganic cations to acid in the sink solution can be controlled at will, relatively inexpensive acids such as hydrochloric or sulfuric acid can be employed, and the expense of adding citric acid is eliminated. After Strontium-90 has been removed, the pH can be readjusted with sodium carbonate to the original level. Accordingly, a sink solution deficient in sodium would be employed so that the reconstituted milk is identical, with respect to all cations except Strontium 90, with fresh milk. With citrate addition, the citrate remains.

At the present time, the cost of a complete electrodialysis plant having an effective membrane area of 9,000 feet is \$100,000 "skid-mounted". This current cost reflects, in part, development and research costs and the limited production of devices of this kind at the present time. It is estimated that these costs will drop by at least one-third in the next few years. Since the area required to treat 100,000 pounds of milk in an eight hour day is 5000 square feet of effective membrane area, Dr. Gregor claims that the electrodialysis plant required to treat this amount of milk will cost \$50,000. The overall life of the unit is estimated to be five years.

## SALMONELLA STILL FOOD THREAT

The onset of summer weather annually presages a spate of public warnings by health officials on the dangers of careless food handling and the agonies suffered by hapless citizens whose digestive apparatus fails to withstand the assaults of a variety of microorganisms often encountered in "tainted" food.

It is perhaps timely, though not particularly pertinent to the season, to note the current revival of concern with the occurrence of Salmonellae in foods and certain food ingredients. At a recent symposium held at Iowa State University, Dr. Betty C. Hobbs of the Central Public Health Laboratory in London, reviewed the incidence of salmonella infections in Great Britain, where the problem has been of perhaps more serious nature than it has in this country, owing to the lack of refrigeration in many homes. In England, between six and seven thousand cases of infection by this family of organisms occur each year. Contamination of foods by human carriers is thought to play a minor role while animal hosts contribute infection to such foods as egg products, poultry meats, and a variety of sausage products. Recent difficulties with contaminated desiccated coconut from Ceylon were traced to insanitary practices in production.

Currently, the Food and Drug Directorate in Canada is waging a campaign against contaminated foods containing Salmonellae in demonstrable numbers. The worst offenders appear to be eggs and egg products with a number of foreign seizures reported to have been made of eggs and egg white imported from the United States. The U. S. Food and Drug Administration is reputedly investigating the problem in this country.

While most authorities agree that foods containing small numbers of this family of bacteria are generally harmless to most adult individuals, the majority of sanitary and health codes prohibit their presence in any amount. Since Salmonellae are quite heat sensitive, rather mild processing (e.g., pasteurization) is usually sufficient to reduce the count to non-detectible levels. Unfortunately, they do resist drying and freezing and can remain viable in some foods for long periods of time. Among the effective sterilizing agents is ethylene oxide which is permitted to be used only on a few types of foods in the United States and not at all in Great Britain. Experimental work is in progress to determine the feasibility of destroying Salmonellae by low intensity radiation from gamma sources.

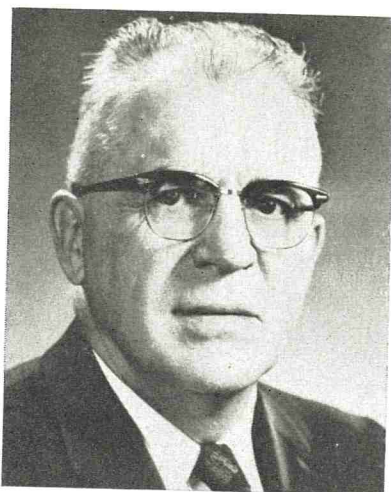
It is of interest that of the many species and subspecies known to the bacteriologist, few of the Salmonellae are proven pathogens for man. Nevertheless, the presence of any of them is taken to indicate contamination in much the same way that "coliform" organisms signify fecal contamination of food and



water supplies. Proof of food poisoning from a suspected source must rest upon serological identification of the type of organism in the excreta of the patient with that in the food in question.

Reprinted from *Food and Drug Research*, May, 1962.

### RUPEL NAMED PRESIDENT OF AMERICAN DAIRY SCIENCE ASSOCIATION



Dr. I. Walker Rupel, newly elected President of the American Dairy Science Association.

At the annual meeting of the American Dairy Science Association held at the University of Maryland June 17-21, Dr. I. Walker Rupel, head of the Dairy Husbandry Department of the Texas A and M College was elected President. Dr. Rupel has been prominent in the Association for many years, serving in a number of important capacities. He served as Vice President under Dr. E. L. Jack of the University of California and Dr. Rupel will carry on his duties as President for 1962-63.

Dr. S. T. Coulter, head of the Department of Dairy Industries, University of Minnesota, was elected Vice-President. Dr. Coulter has been engaged in teaching and research since 1925 and was the winner of the Borden Award in Dairy Manufacturing in 1951.

### FOOD AND NUTRITION BOARD MAKES PRONOUNCEMENT ON MILK AND DAIRY PRODUCTS

The Recommended Dietary Allowances of the Food and Nutrition Board have been widely accepted as guides for the maintenance of good nutrition of healthy persons in the United States. The recommended allowances can be obtained from many combinations and variations in food patterns. In the United States, some foods have attained importance because of their acceptability and special contributions of certain nutrients.

Among these foods, milk and milk products are prominent because they contribute approximately 24% of the protein, 76% of the calcium and 47% of the riboflavin in the national diet. Certain groups in the population such as infants, children, pregnant women and lactating mothers depend more on milk than does the average population for meeting their special needs. Fortified fluid and evaporated milk are sources of Vitamin D for children and adolescents.

In view of the widespread use of milk to provide significant portions of recommended nutrient intakes, unwarranted depreciation of public confidence in milk as a food is not in the best interests of nutritional health of large segments of the population. However, cognizance has to be taken of the effects of overindulgence or possible health hazards and a balanced judgment reached by weighing any possible risks against the health benefits of milk.

The Food and Nutrition Board has given attention to three developments which have generated some public concern about the safety and wholesomeness of foods and of milk in particular. These are: 1. Slight increase in the content of radionuclides in foods, particularly Strontium 90, as the result of fallout from nuclear testing; 2. The possible unfavorable role of saturated fats which predominate in milk, meat and other animal food sources as compared with unsaturated fats; and 3. The presence in foods of residues of agricultural chemicals used in pest control.

The Board's opinion of the current status of these problems is summarized below:

#### *1. Milk and Radionuclides in Foods*

The Food Protection Committee of the Food and Nutrition Board has recently issued a report, "Radionuclides in Foods," which the Board has accepted and approved for publication. The following paragraph is quoted from this report:

"Milk has been the single food item most often used for analysis as an indicator of environmental radiocontamination. This is because milk is produced regularly year-around; is convenient to handle, bulk or aliquot; can be obtained so as to represent small or large areas; and does contain the most important radiocontaminants. It must be emphasized, however, that the most important parameter is the level of contamination of the total diet. The use of milk as an indicator food does not imply that a decrease in the consumption of milk would result in a decrease of the total Sr 90 intake. Foods substituted for milk would probably result in higher intake of Sr 90 because of the higher Sr 90/Ca ratio in such foods."

In the light of the above statement, unless fallout is substantially greater than during the past few years or than is anticipated as a result of recent nuclear weapons tests, there would appear to be little basis for concern with respect to the Strontium 90 content of milk.

## 2. Milk and Saturated Fat

With respect to the wholesomeness of milk fat, emphasis must be placed on the proportionate contribution of milk to the total fat and caloric intake. National statistics indicate that fat content of foods marketed in the U. S. averages 146 grams per person per day. Of this, fluid whole milk and cream contribute 15 grams; butter 9 grams; cheese 3.3 grams; ice cream 2.3 grams; and other dairy products 10 grams. Thus, at least 27% of total fat eaten in the U. S. is milk fat.

Both experimental and epidemiological evidence suggest that ingestion of milk fat and other saturated fats as primary sources of dietary fat, in comparison with an intake of equivalent amounts of unsaturated fats, is associated with higher serum cholesterol levels. There is statistical association between serum cholesterol concentration and coronary artery disease in man. There is as yet no proof that saturated fat in the diet is a cause of atherosclerosis in man but there is a growing body of evidence that it may be. The questions of how much and what kinds of fat can affect the development of atherosclerosis remain unanswered but are subject to very active research and continuing review.

In view of these uncertainties and because many factors are known to influence the onset and course of this disease, the Food and Nutrition Board considers that drastic changes in the American diet with respect to fat intake cannot be recommended at this time.

## 3. Milk and Pesticide Residues

With respect to pesticide residues in milk, concerted efforts over the past few years by Federal and State regulatory agencies, Extension groups, agricultural organizations, industry educational programs to dairy farmers and feed producers, et al., have been directed to reduce levels of residues in milk. Reliable data show that although it is probably not possible to eliminate residues completely, it is possible and practical to produce milk in which residue levels do not exceed 0.1 p.p.m. on a fluid milk basis. In view of established tolerances for other common foods ranging commonly from 7 to 14 p.p.m., the level of 0.1 p.p.m. in milk appears insignificant.

The Food and Nutrition Board in 1960 issued a statement in regard to tolerances for pesticide residues in milk. The conclusion was as follows.

... the Food and Nutrition Board believes that the present policy that only zero tolerances for pesticide residues in milk can be permitted is not scientifically justified. Regulations would be scientifically sound if based on reasonable judgments assuring safety in the case of small residues that are unavoidable in milk even under the best production practices."

The Board reaffirms this conclusion and recom-

mends further that finite tolerances for aggregate pesticide residues in milk and milk products be promptly established under the Pesticide Amendment to the Food, Drug and Cosmetic Act and that such tolerances be at the above mentioned level of 0.1 p.p.m. on the basis of fluid milk containing 3.5% milk fat.

## Conclusion

In view of the foregoing, the Food and Nutrition Board believes that the public can be reassured as to the nutritive value, wholesomeness and safety of milk and recommends the continued use of milk and milk products in view of their importance as dietary components for meeting recommended allowances.

The Board has repeatedly emphasized the nutritional values of the nonfat portion of milk and has encouraged the use of nonfat dry milk. The Board reaffirms this recommendation and would further encourage the Department of Agriculture and the industries concerned with products containing predominantly saturated fats to develop new combination products of high nutritive quality. With modern technology, milk can be viewed as a valuable nutritional resource to be adapted for human use in many acceptable and nutritious combinations.

The Board would also suggest that the nonfat solids could serve better as a nutritional guide for evaluating milk quality than its fat content. The Board is pleased to note that consumption trends for nonfat milk solids from all sources are increasing.

## HELPFUL INFORMATION

**Editorial Note:** Listed below are sources of information on a variety of subjects. Requests for any of the material listed should be sent by letter or postcard to the source indicated.

- Selected Characteristics of Kansas Grade A Dairy Farms.* M. L. Manuel & Leo M. Hoover. Agric'l. Economics Report No. 95, April 1961. Kansas Agric. Expt. Sta., Manhattan.
- You Can Produce Good Flavored Milk.* Circ. 598. College of Agric., Univ. of Wisconsin, Madison.
- 10 Steps in Bulk Milk Pick-up.* Circ. 597. College of Agric., Univ. of Wisconsin, Madison.
- Consumer Acceptance of Milk Handled in Farm and Truck Tanks.* Bulletin 559. Montana Agric. Expt. Station, Bozeman.
- Milk Flavor Defects and How to Control Them.* Circ. 232. Montana Agric. Expt. Station, Bozeman.
- Hand Washing Nozzles for Use in Poultry Processing Plants.* Circ. N. S. 25. Georgia Agric. Expt. Station, Athens.
- Obtaining Milk Weights with a Milk-Metering Device.* Bulletin 494. South Carolina Agric. Expt. Station, Clemson.
- Conveyor Feed System for Dairy Cows in Stanchion and in Loose Housing, Progress Report 4, Baled Hay Meter.* Bulletin 622. Vermont Agric. Expt. Station, Burlington.
- Legal Aspects of Marketing Sterilized Concentrated Milk.* Res. Bulletin 232. Univ. of Wisconsin College of Agric., Madison.



Harold Walters, (left) with the Tim E. Sullivan Award which was presented to him by Frank E. Fisher, (right) chairman of the Awards Committee.

### WALTERS RECIPIENT OF SULLIVAN MEMORIAL AWARD

Harold Walters, sanitarian for the Montgomery County (Indiana) Health Department was honored by being the recipient of the Timothy E. Sullivan Award. The award was presented recently at the annual meeting of the Indiana Public Health Association, held at Indianapolis. Mr. Walters was the first recipient to be so honored.

The Tim E. Sullivan award was established in 1961 by friends and associates of Mr. Sullivan and is to be awarded annually. Until his death in 1961, he was the Director of the Division of Foods and Drugs, Indiana State Board of Health. The award, which consists of an appropriately inscribed plaque, is to be presented annually to the outstanding sanitarian in Indiana who has done exemplary work in food and drug control.

Mr. Walters was selected by the Awards Committee because of the effective program he is carrying on and because of his knowledge of his community, its needs, and desires. He has made effective use of the local press, organizations and individuals in motivating the community toward accomplishment in sanitation work. Mr. Walters is

past president of the County Advisory Health Council and at present is a Director. He is a member of the Indiana Association of Sanitarians, The Indiana Public Health Association and the International Association of Milk and Food Sanitarians. His friends and colleagues extend congratulations for the winning of this deserved honor.

### PEACE CORPS SEEKING VOLUNTEERS

A recent communication from the Office of the Peace Corps in Washington, calls attention to the need for volunteers for a project about to be launched in Brazil in the San Francisco valley. The government of Brazil has asked for 181 men and women to assist with this project. Of the 181 needed, 68 are wanted in the field of health and 113 volunteers in agriculture, engineering and miscellaneous disciplines.

In 1948, the government of Brazil commenced a systematic development of the San Francisco river valley, an area in which 5 1/2 million people live. The San Francisco Valley Commission (CVSF) was organized as an autonomous, non-political development corporation answerable only to the President

of the country and financed by law with one per cent of the federal budget. The CVSF worked up an integrated development plan for the valley, a kind of TVA embracing all aspects of valley life from navigation, hydroelectric power, and flood control to transportation, communications, irrigation, agricultural development and health services. A great deal of development has already been accomplished and if Brazil didn't suffer a chronic shortage of skilled middle manpower much more could be done. The CVSF has never had any outside help or received any U. S. foreign aid, but the commission has now enthusiastically asked the assistance of the Peace Corps.

Each Peace Corps training program is designed so that no Volunteer is sent overseas who is unprepared to carry out successfully his part of the project which he has joined. Also, each training program is specifically tailored to meet the special requirements of that particular project. This means that final arrangements and negotiations for the training programs—involving the final selection of a training agency, whether a university or some other institution, or the importation of host-country experts to act as instructors—are usually not completed until shortly before the Volunteers are scheduled to arrive. This is the case with the San Francisco Valley project.

In general it can be said, however, that training for this project will involve eight weeks of intensive instruction in the United States, one month at the Peace Corps Field Training Center in Puerto Rico and two weeks in country orientation, possibly at the Tres Marias dam and power plant on the San Francisco River.

All Volunteers will be given intensive instruction in the Portuguese language throughout the training program. They will also be given courses in the customs, culture and history of Brazil with particular emphasis on the history and program of the CVSF. Volunteers will be given a refresher course in the civilization of the U. S. and a review of contemporary world problems. Insofar as possible, considering the wide range of job categories in this project, volunteers will be given refresher courses in their specialities with emphasis on local problems likely to be encountered in Brazil. They will also be given training in public health including the standard first aid course, and instruction in personal health care in the tropics. In Puerto Rico, the Volunteers will participate in a physical fitness program while being conditioned to a tropical environment. They will also have a chance there for a close inspection of culture predominately Latin American.

Those interested should address a letter to the Peace Corps, Washington 25, D. C.

## LETTERS TO THE EDITOR

Dear President Walton:

We want to thank you for your efforts in getting our petition approved by the Executive Board, and thus enabling us to procure a charter. The Charter has been delivered to Mr. A. R. Russell, our Secretary-Treasurer.

We are now about six months old and have a membership of 96 (less one lost by death). This has been very surprising to me, as I thought we would be doing exceedingly well to have a paid membership of approximately seventy. Our Association has been enthusiastically received, not only by the Sanitarians, but by our State officials.

With all new organizations there has been some discussion with us, in the membership and out, about the name of the International Association. At our last Executive Board meeting, I was instructed to write you that the Mississippi Association of Sanitarians had gone on record supporting the Georgia Association's resolution changing the name of the International Association to read, "International Association of Milk, Food and Environmental Sanitarians." We understand this resolution will be acted upon at the October meeting in Philadelphia. I am sure that with this change, and a little more information on Environment Health activities in the Journal, we can organize our Association 100%. We would like your serious consideration in this matter, and would appreciate anything you can do.

We have definitely set the date for our State convention as Nov. 5th and 6th in Jackson, Miss.

With kind regards, I am

Sincerely,

s/Jean E. Norris, President

Mississippi Association of Sanitarians

July 2, 1962

Mr. H. L. Thomasson

Shelbyville, Indiana

Dear Red:

As you probably know the Rhode Island Affiliate has been giving a \$200 scholarship at the University of Rhode Island to a student in the dairy industry. At the last meeting of the board of governors it was voted that henceforth this scholarship would be known as the Charles B. Ross Memorial Scholarship in memory of a late member. Wondering if you could give this a little write up in the Journal.

By the way, if you are in the area here on August 8 we would be pleased to have you attend our annual outing.

Very truly yours,

R. I. Association of Dairy and Food Sanitarians

s/Sidney Shepard

Secretary-Treasurer

## CALENDAR OF MEETINGS

1962

- August 5-8—West Virginia Dairy Products Association, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, West Virginia. Administrative Officer, S. J. Weese, West Va. University Dairy, Morgantown, W. Va.
- August 10-25—School and Community Health Workshop, Indiana Univ., Bloomington, Ind.
- Sept. 3-7—XVI International Dairy Congress, Copenhagen, Denmark.
- Sept. 5-7—Iowa Milk and Ice Cream Mfgs., Associations, Workshop Outing, The New Inn, Lake Okoboji, Iowa. Administrative Officer, John H. Brockway, 710 Fifth Ave., Des Moines, Iowa.
- Sept. 10-11—Wisconsin Ass'n. Milk and Food Sanitarians, Annual Meeting. Dell View Hotel, Lake Delton, Wisconsin. Administrative Officer, L. Wayne Brown, 421 Chemistry Bldg., University of Wisconsin, Madison 6, Wisc.
- Sept. 10-12—Association of Ice Cream Mfgs. of New York State, Annual Meeting, Whiteface Inn, Whiteface, N. Y. Administrative Officer, Peter F. Rossi, 405 Lexington Ave., New York 17, N. Y.
- Sept. 11-13—University of Minnesota, Dept. of Dairy Industries, Dairy Products Institute Meeting, Dairy Industries Bldg., St. Paul Minnesota. Administrative Officer, S. T. Coulter, Head, Dept. of Dairy Industries, University of Minnesota, St. Paul 1, Minn.
- Sept. 12-13—National Dairy Council Board of Directors Meeting, Sheraton-Chicago Hotel, Chicago, Illinois. Administrative Officer, Milton Hult, 111 North Canal Street, Chicago 6, Illinois.
- Sept. 17—Wisconsin Creameries Association, Annual Convention, Whiting Hotel, Stevens Point, Wisconsin. Administrative Officer, Oscar Christianson, 1 West Main Street, Madison, Wisconsin.
- Sept. 18-20—American Dairy Association Board of Directors & State Managers Meeting, Olympic Hotel, Seattle, Washington. Administrative Officer, M. J. Framberger, 20 N. Wacker Drive, Chicago, Illinois.
- Sept. 19-21—National Ass'n. of Dairy Equip. Mfgs., Members only, Lake Lawn Lodge, Delavan, Wisc. Administrative Officer, John Marshall, 1012 14th St., N. W., Washington, D. C.
- Sept. 24—Dairy Mixers, Inc., of Philadelphia, Annual Outing, Aronimink Country Club, Philadelphia, Pa. Administrative Officer, Ernst J. C. Fischer, 2809 W. Queen Lane, Philadelphia 29, Pa.
- Sept. 24-26—Cornell Dairy Industry Conference—New York State Ass'n. Milk Sanitarians, Joint Conference. Hotel Niagara, Niagara Falls, N. Y. Administrative Officer, R. P. March, 118 Stocking Hall, Cornell University, Ithaca, N. Y.
- Sept. 24-26—American Dairy Association, Board of Directors & State Managers Meeting, Olympic Hotel, Seattle, Washington. Administrative Officer, M. J. Framberger, 20 N. Wacker Drive, Chicago 6, Ill.
- September 24-26—National Dairy Council of Canada, Annual Convention, Empress Hotel, Victoria, B. C. Administrative Officer, W. K. St. John, Journal Bldg., Ottawa, Canada.
- Sept. 27—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago 1, Illinois.
- Oct. 2-3—Minnesota Creamery Operators' and Managers' Association, Annual Convention and Business Sessions. Hotel Lowry, St. Paul, Minnesota. Administrative Officer, Floyd Thompson, 416 New York Building, St. Paul 1, Minnesota.
- October 8-12—12th Annual Instrument Symposium and Research Equipment Exhibit, National Institutes of Health, Bethesda 14, Maryland. Administrative Officer, James B. Davis, National Institutes of Health, Bethesda 14, Maryland.
- Oct. 9-10—ADA of North Dakota and North Dakota Dairy Industries Ass'n., Joint Annual Meeting, Gardner Hotel, Fargo, N. D. Administrative Officer, Vernon L. Pepple, 819 Avenue B. West, Bismarck, N. D.
- Oct. 10-11—Vermont Dairy Industry Association, Annual Meeting and Educational Conference, University of Vermont, Burlington, Vt. Administrative Officer, Henry V. Atherton, Dairy Bldg., Burlington, Vt.
- Oct. 10-11—Washington State Dairy Foundation, Statewide Convention, Chinook Hotel, Yakima, Wash. Administrative Officer, Robert J. Keyser, 550 Skinner Bldg., Seattle 1, Wash.
- Oct. 13-16—National Automatic Merchandising Association, Brooks Hall, San Francisco, Calif.
- Oct. 19-20—Iowa Creameries Association, Iowa Milk Producers Federation, Iowa Milk Driers Ass'n., State Convention, Hotel Roosevelt, Cedar Rapids, Iowa. Administrative Officer, Arthur Kirchhoff, P. O. Box 377, Ames, Iowa.
- Oct. 21-24—National Association of Food Chains, Annual Convention, Denver Hilton & Brown Palace Hotels, Denver, Colo. Administrative Officer, Clarence Adamy, 1725 Eye Street, N. W., Washington 6, D. C.
- Oct. 24-27—International Association of Milk and Food Sanitarians, Inc. Annual Meeting, Ben Franklin Hotel, Philadelphia, Pennsylvania. Administrative Officer, H. L. Thomasson, P. O. Box 437, Shelbyville, Indiana.
- Oct. 28-Nov. 2—Dairy Exposition, Atlantic City, New Jersey. Administrative Officer, Joseph Cunningham, Dairy Industry Supply Association, 1145 - 19th St. N. W., Washington, D. C.
- Oct. 29-31—National Association of Retail Ice Cream Mfgs., Inc., Annual National Convention, Hotel Haddon Hall,

Atlantic City, N. J. Administrative Officer, E. M. Warder, 2223 Detroit Ave., Toledo 6, Ohio.

Oct. 29-31—Milk Industry Foundation, Annual Convention, Dennis Hotel, Atlantic City, N. J. Administrative Officer, E. L. Peterson, 1145 19th St., N. W. Washington 6, D. C.

Oct. 31—Evaporated Milk Ass'n., Industry Meeting, Atlantic City, N. J. Administrative Officer, E. H. Parfitt, 228 N. LaSalle St., Chicago 1, Ill.

Oct. 31-Nov. 2—International Association of Ice Cream Mfgs., Annual Convention, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Administrative Officer, Robert H. North, 1105 Barr Building, Washington 6, D. C.

Nov. 7-8—Wisconsin Cheese Makers' Association, 71st Annual Meeting and 1962 Worlds Championship Cheddar Contest, Northland Hotel, Green Bay, Wisc. Administrative Officer, Joseph J. Bauer, 115 W. Main St., Madison 3, Wisc.

Nov. 9-10—Missouri Butter and Cheese Institute, Educational Conference and Convention, Missouri Hotel, Jefferson City, Mo. Administrative Officer, W. H. E. Reid, Eckles Hall, Univ. of Missouri, Columbia, Mo.

Nov. 12-14—Grocery Manufacturers of America, Inc., Annual Meeting, Waldorf Hotel, New York, New York. Administrative Officer, Paul S. Willis, 205 E. 42nd Street, New York 17, N. Y.

Nov. 19-20—South Dakota State Dairy Association, Annual Convention, Sheraton Cataract Hotel, Sioux Falls, S. Dakota. Administrative Officer, Ervin Kurtz, Brookings, S. Dakota.

Nov. 26-29—Southern Association of Ice Cream Manufacturers, 48th Annual Convention, Americana Hotel, Bal Harbor, Fla. Administrative Officer, Edward J. Koontz, Box 5107, Biltmore, N. Carolina.

Nov. 27-28—Northwest Association of Ice Cream Manufacturers and Minnesota Milk Council, Annual Convention, St. Paul Hotel, St. Paul, Minn. Administrative Officer, D. T. Carlson, P. O. Box 72, Willmar, Minn.

Dec. 2-4—Western States Dairy Convention, Cosmopolitan Hotel, Denver, Colo. Administrative Officer, C. E. Dunlap, 955 11th St., Denver, Colo.

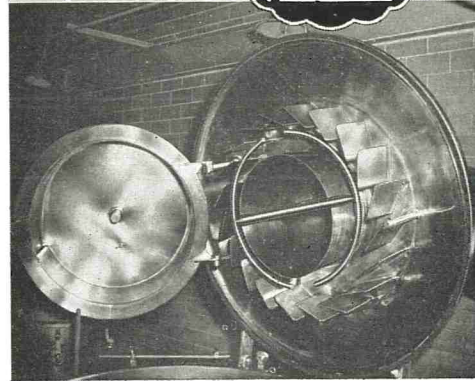
Dec. 6—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago, Illinois.

Dec. 12-14—Wisconsin Dairy Foods Association, Inc., Annual Convention, Schroeder Hotel, Milwaukee, Wisc. Administrative Officer, A. E. Van Thullenar, 222 S. Hamilton St., Madison 3, Wisc.

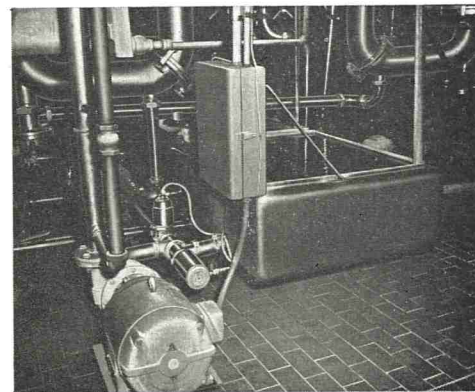
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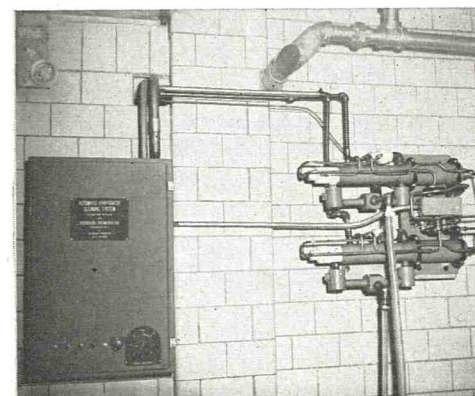
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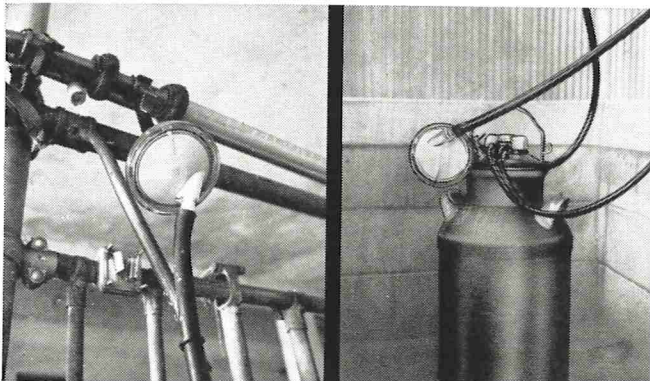
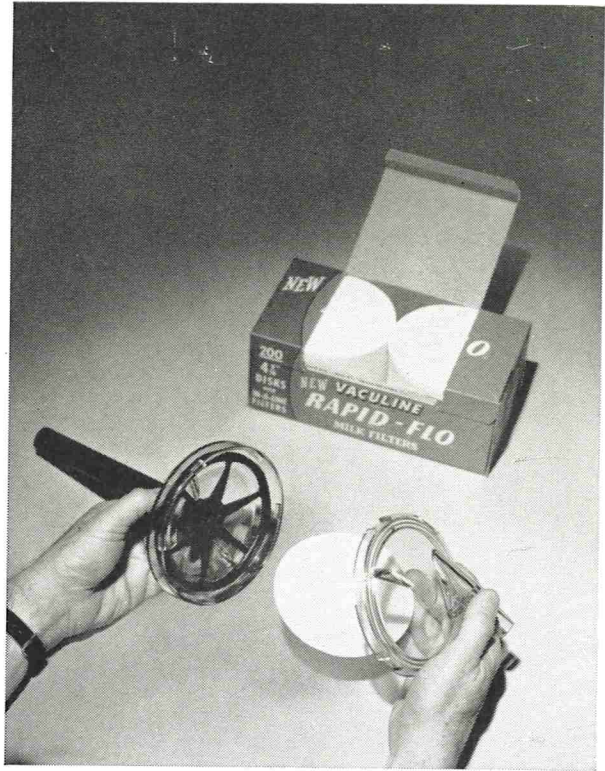
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# Memo

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**Subject: Sanitarians**

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2. Show this sketch to
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