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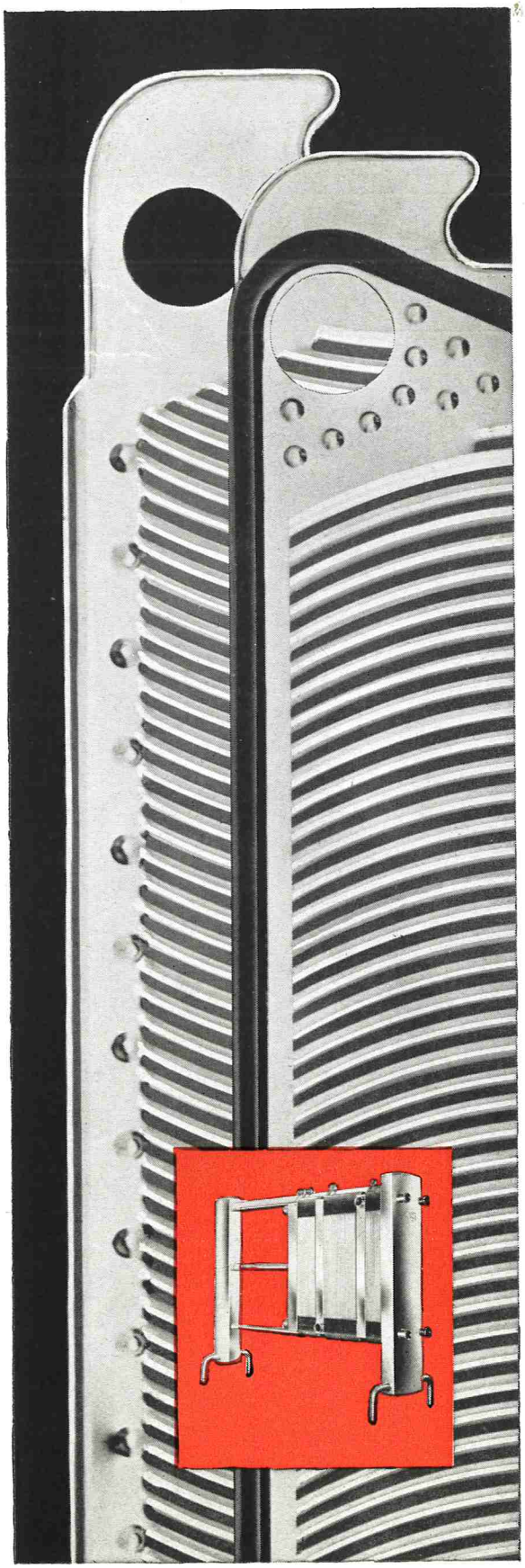

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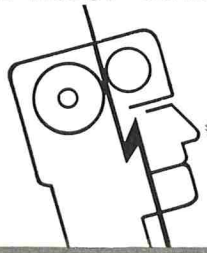

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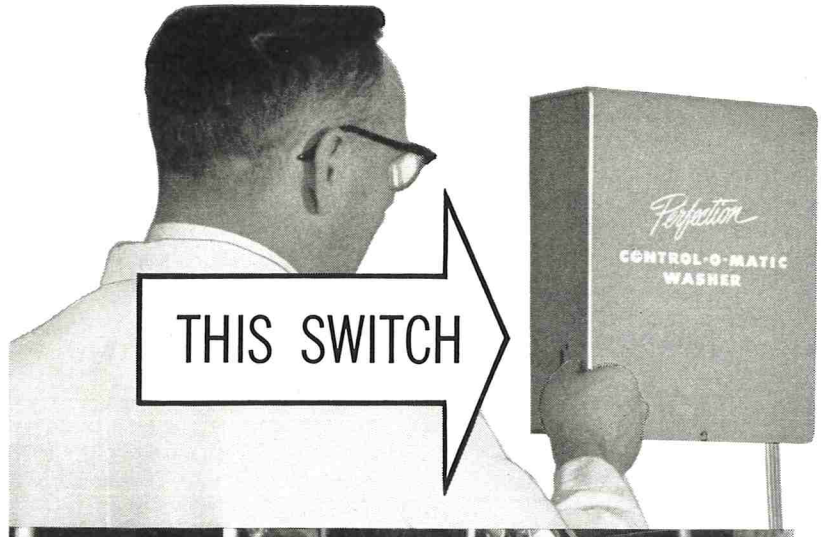

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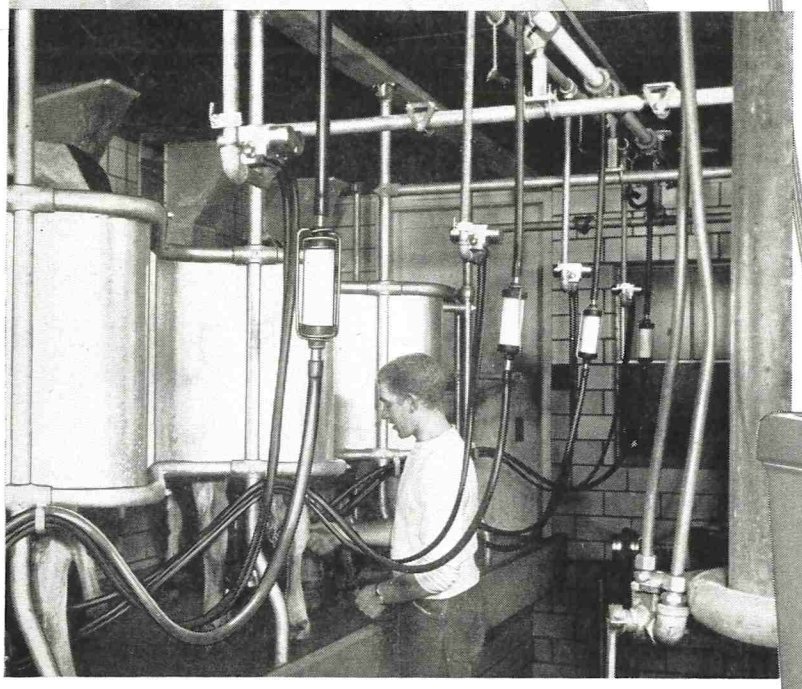

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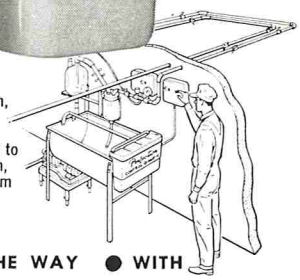

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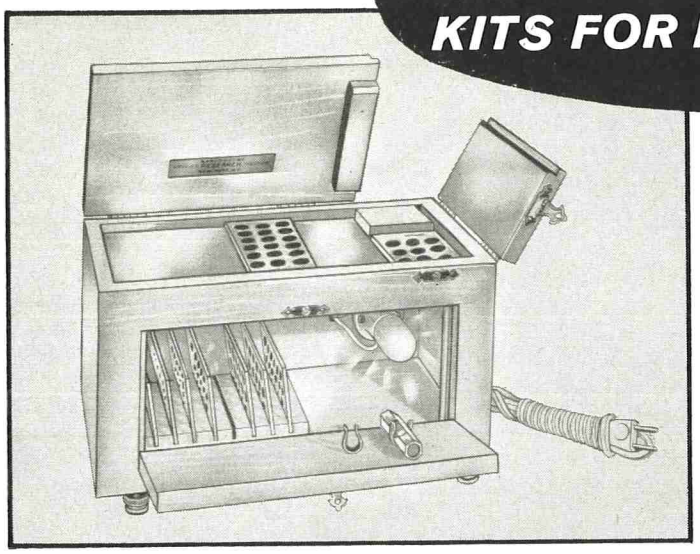

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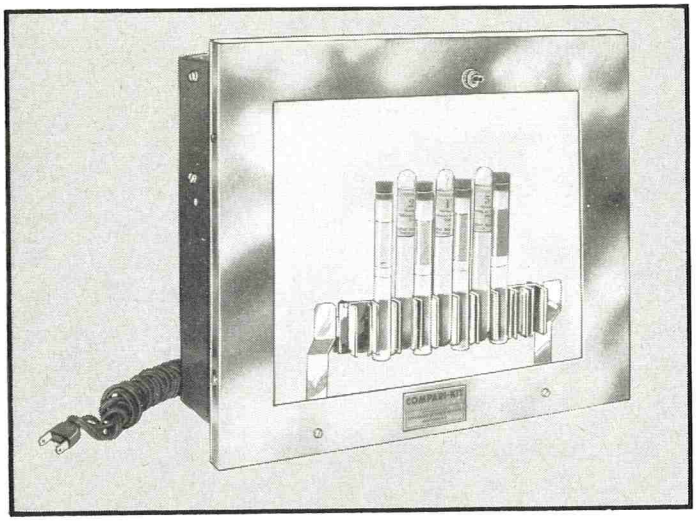

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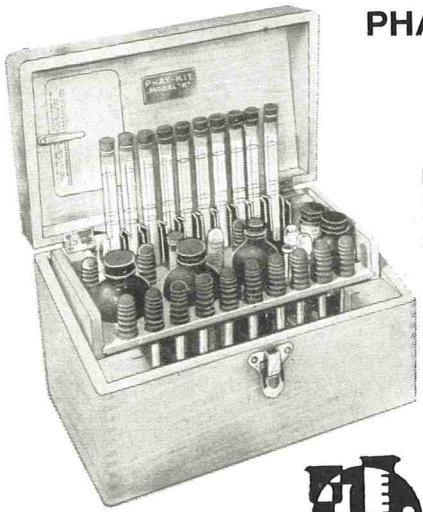

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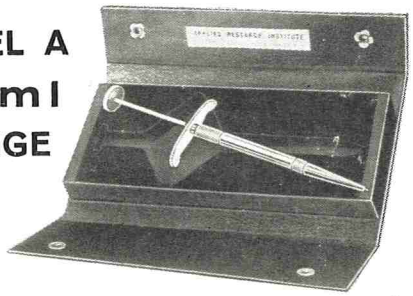

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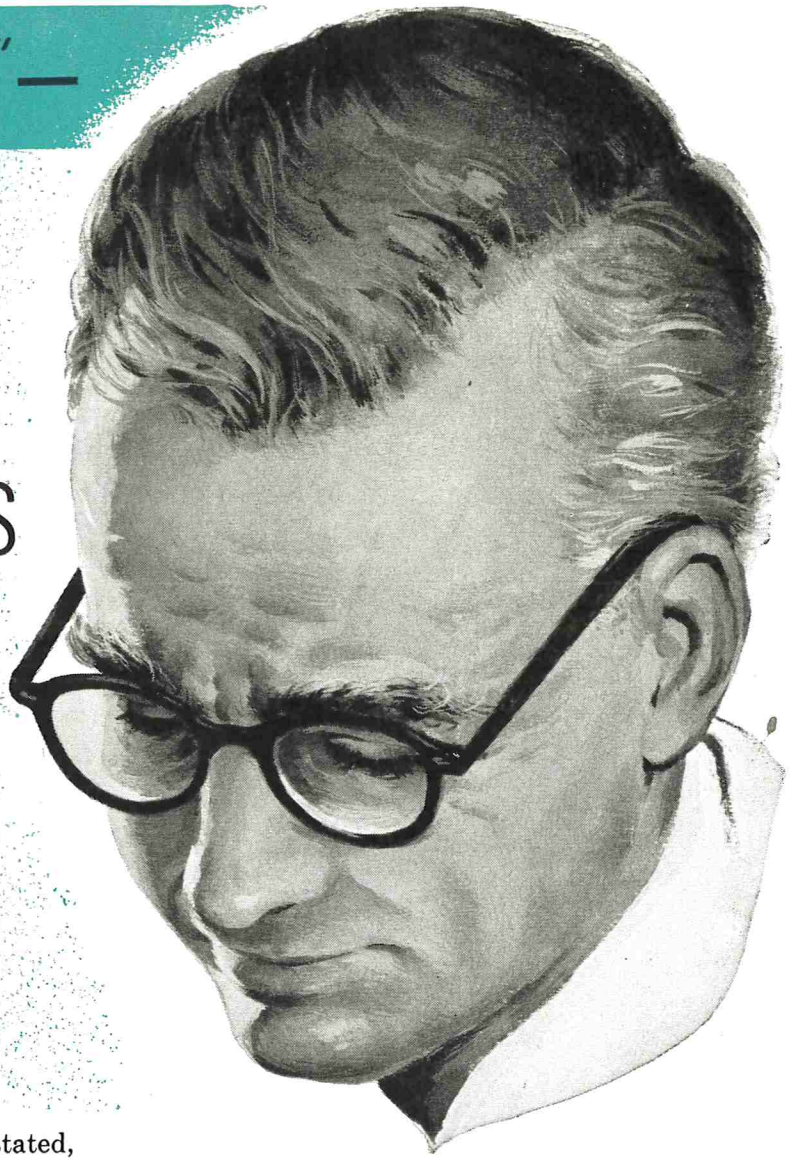

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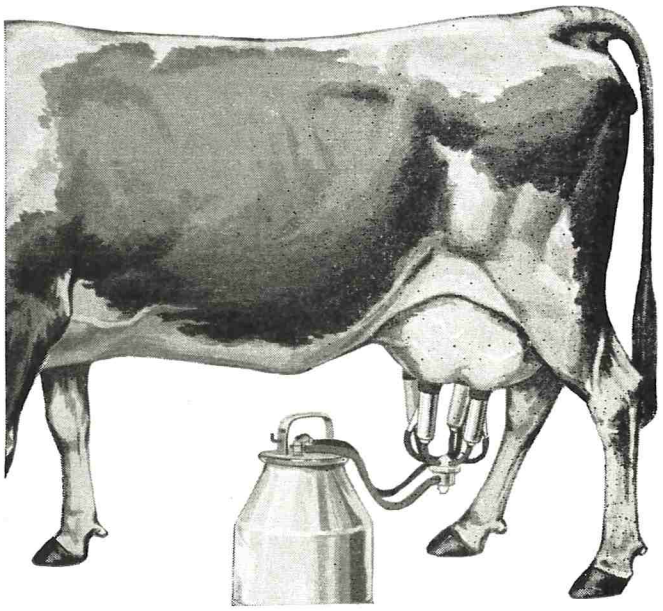

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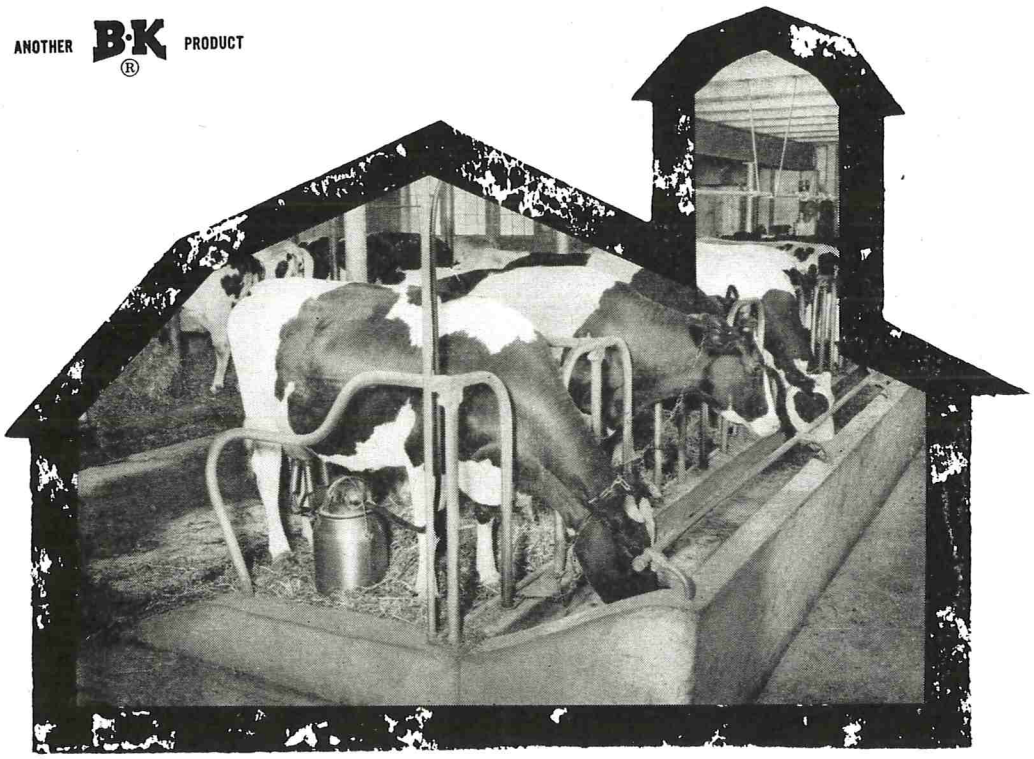

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A REVIEW OF REGULATIONS GOVERNING THE PREPARATION OF FRESH CRABMEAT

M. A. BENARDE

Seafood Processing Laboratory,

University of Maryland, Crisfield

Crabmeat processing for interstate retail consumption is practiced in nine Atlantic and Gulf states from Maryland to Louisiana. In order to discover differences and similarities in state regulations controlling crabmeat production in these states, comparison of the individual state regulations (as authorized by state codes) seemed worth while. Such a comparison may well indicate common strength and weaknesses and perhaps point to areas that could be improved upon by future study and experimentation.

All states require a permit to operate crabmeat processing establishments, and the states reserve the power to revoke these operating certificates, for cause. This can be a powerful deterrent to marginal or habitual offenders. Only South Carolina, however, actually specifies a jail term along with a fine of $100 for violations. Maryland, alone, of the other states specifies fines of $25 to $100 for violations. It is of interest to note that only two of the nine states, Virginia and Georgia, specifically deny certified plants the right of handling meat from a non-certified plant. Further perusal reveals that only two other states, Florida and North Carolina require certificates of health from all plant employees. The other states indicate that inspection of the workers for sores, suppurating wounds and communicable diseases, is sufficient.

With the exception of North Carolina, all states specify that in-plant water supplies are to be approved by a regulatory authority, usually the State Health Department. Four of the nine states specify the size of wire mesh to be used on all screening in the plants; Louisiana, Alabama, North and South Carolina and Maryland, on the other hand, have no such specifications.

The amount of light available to the pickers is of interest because of the variability encountered. Surface brightness, more commonly known as candle power (measured in foot-candles or more correctly, lumens per square foot) varies from 5 in Florida and 10 in Virginia, to 20 in Maryland. The other states indicate that an "adequate" amount be supplied. It may be helpful to compare these stipulated values with several for different conditions (*12*):

Halls	5-10 foot-candles
Reading Room	15-25 foot-candles
Office	10-20 foot-candles
Sewing (light)	20-50 foot-candles
Work bench	40-50 foot-candles
Kitchen — work counter	40-50 foot-candles

Most states specify interior wall surfaces to be smooth and light-colored for ease in cleaning. All states specify that wherever metal is used, it is to be smooth and non-porous. Most of the states mention "corrosion" resistant metal. This is a rather ambiguous term. Perhaps rust-resistant is meant. Whereas all metals are subject to corrosion, only some rust. Relative to floor conditions, all states specify floors to be made of impervious material for ease of cleaning and prevention of odors from absorbed organic material. As to employee facilities and industrial hygiene, four states do not specify the number of wash basins per employee, while Virginia and Georgia note one per 20 persons. Maryland specifies one for 10-15 persons. These figures compare with the 1 basin per 10 persons recommended by the American Standard Association.

In prescribing for an adequate number of toilet bowls, quite a variation is found among the states. The following list suggests the lack of uniformity in answering the problem:

	Number of persons per toilet bowl	
	Men	Women
Florida	40	25
Maryland	30	20
Virginia	30	20
N. Carolina	30	30
S. Carolina	NS	NS
Georgia	30	20
Alabama	NS[a]	NS
Mississippi	NS	NS
Louisiana	25	25

[a]NS = Not Specified

The American Standard Safety Code for Industrial Sanitation in Manufacturing Establishments, recommends 1 bowl for 1-9 persons and 2 for 10-24. This is somewhat different than generally found.

The states either specify the use of chlorine dip and washing solutions at concentrations up to 200 ppm or simply note the use of an approved bactericide. This is an area that might be considerably benefited by future experimentation. The bactericidal or bacteriostatic activity of commercially available germi-

TABLE 1—A COMPARISON, BY STATES, OF CRABMEAT PLANT REGULATIONS

Regulations	Md.	Vir.	N. Car.	S. Car.	Georgia	Fla.	Ala.	Miss.	La.
Workers require certificate of health	A	A	X	A	A	X	A	A	A
State approved water supply	X	X	A	X	X	X	X	X	X
Screening: at least 14-16 mesh; doors opening out & self-closing	X*	X	*	X	X	X	X*	X	X*
Walls of smooth material	X	X	X	X	X	X	X	X	A
Lighting: foot-candles on working surfaces	X_{20}	X_{10}	0	0	0	X_5	0	0	0
Equipment surfaces: smooth, impervious metal	X	X	X	X	X	X	X	X	X
Floors of impervious material	X	X	X	X	X	X	X	X	X
Separate processing areas	X	X	X	X	X	X	X	A	X
Employees per wash basin	$X_{10\ 15}$	X_{20}	A	A	X_{20}	A	A	A	A
Chlorine dip (50-100 ppm)	X	A	A	X	A	A	A	X_{200}	X
Approved bactericide	A	X	A	X	X	X	A	A	X
Heat treatment for utensil and equipment (at least 170°F. 2 minutes)	A	X	A	X	X	A	X	X	X
Scrap removed from plant area each day	X	X	X	X	X	A	A	A	A

Legend: X = complance; O = adequate but type not specified; A = not mentioned; * = mesh not specified

cides has not been fully evaluated under in-plant conditions. *In vitro* testing leaves much to be desired. Several states specify that all utensils and equipment are to be sterilized for at least 5 minutes at 170°F. Several other states do not mention this treatment. It becomes apparent on reading the state regulations that the words "sterilize" or "sterilizing" are used loosely. As employed therein, the terms probably mean reduction of bacterial numbers rather than the only definition, the destruction of all forms of life. Here again experimentation might yield valuable information that could aid both the processor and the agencies charged with formulation of adequate regulations.

The removal of dead crabs before steaming is practiced by some processors throughout the country. The larger processors allow the dead crabs to be cooked and then removed by the pickers. It is thus of interest to note that both Alabama and Mississippi stipulate that dead or still crabs are to be removed before steaming. It would be interesting to learn the basis for this injunction.

Straightforward uncomplicated explanations can be given for each of the prohibitions specified. Actually, however, little firm data concerning these points, have been published. Many of the specifications were probably adopted after long observation in all types of food producing establishments. The following examples[1] seem to bear this out:

FLOORS

1. Floors shall be constructed of concrete or other material impervious to water, and shall be graded to drain quickly, shall be free from cracks and uneven surfaces that interfere with proper cleaning or drainage, and shall be maintained in good condition.

PUBLIC HEALTH REASON

Properly graded floors, of durable, impervious material, maintained in good condition, permit rapid disposal of liquid and solid wastes, and are easily cleaned.

WALLS AND CEILINGS

2. The interior surfaces of rooms in which shellfish are shucked or packed, or in which utensils are washed, shall be smooth, washable, light colored, and kept in good repair.

PUBLIC HEALTH REASON

Smooth, washable walls and ceilings are more easily kept clean and are, therefore, more likely to keep clean. A light colored paint or finish aids in the distribution of light and in

the detection of unclean surfaces. Clean walls and ceilings are conducive to clean shellfish handling.

Almost all the states use the legalistic language which is purposefully general and sometimes vague. It appears that all the states use the federal pronouncements as guides for promulgating their own state statutes. Thus, it becomes apparent that for the most part, each state could interchange regulations without loss of individuality as little of this exists. On the whole, the regulations are such that compliance could result in excellent plant sanitation.

Table 1, compares thirteen topics covered in the state regulations.

[1]Examples taken from *Sanitary Control of the Shellfish Industry Manual of Recommended Practice.* Part II. 1957. Similar examples can be found in The Rules & Regulations of the State of South Carolina. Although the other states do not write them out in this fashion, all are guided by them.

REFERENCES

NOTE: Citations 1-10, refer to the individual state and federal rules and regulations for the sanitary control of the handling, packing, and marketing of seafood for human consumption.

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2. Commonwealth of Virginia, Department of Health. Chap. VIII . Sections 28-160 and 28-168 of the Code of Virginia, Richmond, Virginia. 1952.

3. North Carolina Commercial Fisheries. Rules and Regulations: Sub-Chapter IV of Chapter 113 of the General Statutes of North Carolina, Raleigh, North Carolina. October 1955.

4. South Carolina, State Board of Health. Offcial Rules and Regulations of the State Board of Health, Section 5002, Code of Laws. April 1951. Columbia, S. C.

5. Georgia State Department of Agriculture. Rules and Regulations for Crabmeat Plants. December, 1954.

6. Florida State Sanitary Code, Chapter XV. Chapter 381 Sections 381. 49-381 .59 Florida Statutes 1941 and Amendments.

7. Louisiana State Board of Health. Rules and Regulations. Chap. IV. Marine and Fresh-water Animal Food Products (Seafoods).

8. Mississippi State Board of Health. Rules and Regulations adopted May 11, 1937.

9. Alabama State Board of Health. Rules and Regulations Governing the Preparation, Picking, Packing, and Sale of Crabmeat and Cooked Shrimp. Subsection 6, Section 1051, Code of Alabama 1923, and Section 1146 as amended September 13, 1935.

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12. Fuller, R. W., Brown, R. B., and Baker, D. L. *Elements of Physics.* Chap. 20. 1948.

THE NATIONAL RESTAURANT ASSOCIATION LOOKS AT FOOD SANITATION[1]

DONALD GREENAWAY

National Restaurant Association

Chicago, Illinois

The National Restaurant Association is honored to be invited to participate in the deliberations of the International Association of Milk and Food Sanitarians, Inc. The National Restaurant Association wishes to state clearly to your membership its interest in your professional progress and your work. It is an error to assume that the aims and objectives of profesional sanitarians are not compatible with the interest of the people in the restaurant industry, for both groups operate in the public interest.

So that you may better understand the national restaurant industry and its leadership thinking, it may be well at the outset to tell you a little of the history and the background of its principal trade association. It will also prove useful in telling you a little about the aims and objectives of the Association as these were adopted by the people who founded the Association in 1919.

The industry was fortunate indeed in its leadership during its formative years, and is even more fortunate today in the type of leadership which continues to subscribe to high ethical and moral values in a world in which values have often been subverted.

The National Restaurant Association is younger than your association by ten years. It was founded as a result of a chance meeting of seven prominent restaurateurs at a Rotary International meeting. At that meeting these seven founders of our Association met for the first time and each found the other to be public spirited and broad-thinking individuals. They were mature business men who realized that the industry needed welding together in a common over-all association. Out of this chance meeting in 1919 came the birth of the organization which is today the National Restaurant Association.

The Association has grown in structure, stature, and strength over the years. Today it represents the vast majority of the businesses which feed America's millions. It is interesting and important to tell you that within the first four years of its origin, the Association developed and the membership accepted a "Standards of Business Practice." These Standards are philosophical and practical statements of intent which have been widely copied throughout business in the English-speaking world.

The Association is proud of the fact that eleven years before the birth and untimely demise of the "Blue Eagle of Business Standards," promoted by the government in 1933, the industry had such a creed. The preamble to these "Standards of Business Practice" reads as follows:

"Members of the National Restaurant Association are pledged to operate their businesses in accordance with the highest standards of restaurant practice, and to be ever mindful of their public responsibility."

On page eleven of our "Standards of Business Practice" our members are enjoined *"to have an orderly and inviting place of business. It shall be kept spotlessly clean and absolutely sanitary . . . Further, the restaurateur shall have all foodstuff thoroughly inspected and examined before service or self-service, and further the restaurateur shall not use materials other than those of known purity and wholesomeness."*

Other parts of these Standards cover mis-branding, misrepresentation, and adulteration. These "Standards of Business Practice" were adopted at the fourth annual convention of the Association in 1922, and are still contained in present publications. It is significant that the ordinances being written today for the control of sanitation in our establishments contain much of the same language as that found in our "Standards of Business Practice" of 1922.

Whether our "Standards of Business Practice" as originally written were lifted intact from the language of existing codes or whether present-day codes trace their parentage to documents such as ours, is of little importance. The point is that the National Restaurant Association stands now as it did thirty-six years ago for exactly the same things that are desired by conscientious men in the sanitary services across the nation. We recognize that we are in a public service of an intimate and delicate nature which affects the life, health, and welfare of all our citizens.

Throughout the long history of the National Restaurant Association, it has never stood opposed to any law or anybody responsible for the application of a law in these or other related matters. By and large, it can be said without fear of contradiction that the Association has and always has had a spotless record

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[1]Presented at the Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., August 26-28, 1959 at Glenwood Springs, Colorado.

in its relations with government agencies at all levels. Today, the Association represents perhaps seventy thousand businesses which publicly serve seventy to eighty million meals in every twenty-four hours, which employ more than a million and a half workers, and which gross more than seventeen billion dollars a year in sales. The industry feeds the nation's children, teenagers, industrial workers, travelers, and pleasure seekers. It is an important cog in the business, industrial, and economic scheme of America.

Having recognized the strength of the industry, it is also important to point out its weaknesses and problems. Not all restaurant men operate their businesses in conformance with the code of ethics. Not all restaurant men are public spirited. Some are extremely selfish. Not all restaurant men are enlightened individuals.

Some – fortunately a very small percentage – operate at the very periphery of the law and constantly test the patience of those whose responsibility it is to enforce the laws and protect the public. The Association offers no excuse for these individuals and understands your frustration in dealing with groups who try to by-pass the law or test its worthiness. This is mentioned only to remind you that you should not construe your problems with the backward members of our industry as representing the problems in dealing with the total industry. Our members, by and large, want to be, desire to be, and hope to be on the right side of public issues.

At the heart of the thinking of many small business men today, there is the thought that the government is pushing too deeply into the private lives and the undertakings of individuals. It has taken all of us a long time to accept the idea that private property rights in a licensed business are not the same as the sanctity of the home. It is even more difficult for business men to accept the idea that the right to found and operate a business in a free land is a privilege which can be withdrawn at the pleasure of the public. Business men have had difficulty in retreating from the idea that in the American free enterprise system a business is an entity unto itself only answerable to the tax collector. In the last thirty years restaurant owners have slowly but surely abandoned this idea as they recognize that businesses operate in a social as well as an economic climate. Some of the opposition and the troubles, which you people have had in dealing with men in our industry, arise out of this simple psychological factor.

Today, they are willing to accept the mandates of the people as these are projected through our governmental agencies, provided they understand what is intended and provided they believe that what is done is done fairly, with justice, within the law, and with intelligence based on enlightenment.

You have now had laid before you our beliefs, our doctrines, and our innermost thoughts as you approach us wearing the badge of governmental authority. It is recognized that you are people with special training, highly dedicated to your jobs, and acting within your knowledge of what is best in the public interest. It is recognized that you are required in your jobs to do those things which are intended for the protection of the public.

Most restaurateurs are not scientists, engineers, technicians, bacteriologists, or specialists in medical matters. They are management people with a specialized knowledge in the preparation and service of food as the public wants it. They vaguely recognize that your codes and ordinances now have gone beyond a list of simple rules and have moved into scientific areas covering many fields. It is difficult for them to believe that the specifications backing up your codes and ordinances sufficiently consider the practicality of conditions under which they must operate. They feel fairly certain that some of the things required of them cannot be proven to be in the best interest of food protection and sanitation. They know, for example, that requiring a three-compartment sink and certain water temperatures does not in itself assure the public of clean dishes and utensils, even though under laboratory conditions a three-compartment sink may be entirely satisfactory to accomplish this.

Above and beyond this, they know it is the sanitary training, the motivation, and the desire of the ware-washer, not the presence of or the lack of an additional compartment, which make the difference. They believe that some sanitarians have gone beyond the limit of reasonableness in evaluating small things, while overlooking the important factor of people. They know that a crack in the floor, the wall, or the ceiling rarely has produced toxic effects in food, whereas most of the problems in the safety and protection of food arise from ignorance, carelessness, or indifference on the part of humans.

Rightly or wrongly, they feel that many suggestions, recommendations, and requirements are not based on scientific proofs which can stand up in any Court of Appeal. They are concerned that the many new codes and ordinances written in the sanitary districts of the country will not be uniform in approach and less reasonable in application. They are concerned that many requirements amount to frivolous frills which will require useless and wasteful expenditures of money for capital improvements that are really not necessary. They are more than deeply concerned when they realize in the age of science

that present best-known techniques and equipment will be out-dated by better techniques coming out of an onrushing technology. They wonder how they can live with such abruptness of change in direction if they are not permitted time to acclimate themselves to new requirements. A basic fact of life is that the approaches, decor, furnishings, and equipment become obsolete more rapidly with each year. In many forms of the restaurant business, competition forces re-investment over and over again with a shorter and shorter span between the periods of re-investment.

Today the potential sales productivity of business locations changes rapidly. Thus equipment and facilities must be written off rapidly and a sensible point of view is a minimum of investment behind the scenes in order to accommodate quickly changing economics. Thus, they find themselves on the horns of a dilemma, being pressured into maximizing expenditures for ventilation, refrigeration, air-conditioning, storage facilities, preparation and holding facilities, and at the same time feeling the need for minimizing these same investments in order to protect small profits. What may be a minimum requirement to you may be a maximum requirement for their resources.

Herein lies a possible difference of opinion which can prove to be insurmountable unless and until each group proves to be men of good will and responsibility.

If the sanitarian's book is filled with carelessness, indifference, apathy, and outright lawlessness among restaurant men, the book is also filled with examples of unreasonableness, dictatorial use of power, ignorance, and lack of good faith. Examples such as those cited are neither typical of those desired by the restaurant man, nor typical of those desired by the dedicated sanitarians. How then can both groups approach their common task, bearing in mind their final absolute responsibility to the public for what is done? There is a common approach. Both the restaurateur and the sanitarian must attempt to create better run restaurants, better businesses, and better services for the public. The restaurant industry offers the following program as evidence of its good faith and hope for the future:

1. Each year in May, the National Restaurant Association offers the industry the world's largest educational food and equipment show. More than forty thousand operators from all parts of the country come to Chicago to see, listen, observe, and learn. The lessons learned are translated into improved operations and more profitability. Profitability is important for profitable businesses rarely operate outside the law.

Every method of communication possible is used to convince restaurateurs that the good business man is an accepter of responsibility. As a citizen, as a leader, and finally as a profit seeker, he is taught that profits are the wages of service.

2. Since 1941, the Association has operated an Educational Department which has actively encouraged all types of educational undertakings from school recruitment programs in 20,000 high schools in the United States to college and university programs. As a result, thousands of our restaurateurs now have technical training and/or university training. Fourteen major universities now have restaurant management training programs. The Association has operated short courses for many years for people at all levels within our industry. Our hope here is now a reality — thousands of fine young men and women are proud to make their livings in food service establishments.

3. The Association is as conscious of the importance of research as you are. For fourteen years a Research Department has operated within the Association. Research in food poisoning, nutrition, sanitation, and food and equipment development is sponsored and supported. The Association operates with Michigan State University a laboratory dedicated to research in food equipment problems. Important work is being done in this area.

4. The Association has encouraged and nurtured a Society for the Advancement of Research in the Food Service Industry.

5. The Association has given support to the work of the National Sanitation Foundation. Most important, the Association is working actively with the United States Public Health Service on its proposed Code and Ordinance.

6. Finally, our time, our money, and our voluntary efforts are going into educational programs for management supervision in the industry with the thought that the enlightenment of these people will be reflected among their employees.

Any fair-minded individual must conclude that the restaurant industry is doing everything within its power to move the understanding of its people toward clear insight into their responsibilities as business men. In many areas, restaurant people sit on the same advisory boards with your people, with the goal of helping to push sanitary standards higher in their communities. But this is not all. The industry is looking for and would support a National Public Relations Program directed toward creating a cleaner, healthier, safer, and more attractive America. Restaurant men and women know that they are neither the beginning nor the end of the totality of this problem. They know that food protection begins in

the home and that people's attitudes toward personal sanitation only reflect what they have picked up from their environment. People are neither dirty nor clean because they work in restaurants. Restaurant employees are the product of their environments. Finally, they realize that even with the finest approaches and attitudes on the part of management people, America's food will be neither clean nor safe. The problem is deeper than this. This is why the industry is interested in the totality of this problem of food protection.

Now, speaking directly to the sanitarians of America, it is the hope of the industry that, knowing our attitudes, desires, and specific actions taken in order to improve our relations, you people will in turn join with us to produce an era of better understanding and of greater service to the public. In accomplishing this, there are certain things which seem desirable to us:

1. May you continue to professionalize your approaches to the field of sanitation through better understanding of your science and its applications in the affairs of human beings.

2. Will you carefully consider as you write your Codes and Ordinances the ultimate impact they will have on the thousands of businesses which must live under them, remembering always that the failure to comply does not always represent a lack of desire? Economic circumstances, ignorance, lack of understanding, and failure to communicate ideas are most often the reasons why restaurant men and women fail to respond.

3. Will you never cease to remember that the hope of the world is education, not raw force? Given a chance, the majority of the people in our field desire to live within the law.

4. Will you do everything within your power to move from a position of authority to that of a counselor to management, studying every method and means for broadcasting your approaches to your work, rather than centralizing your thoughts on the inconsequential and the trivial?

5. Will you search your science for facts rather than suppositions, and once again concentrate your requirements and specifications on things that will offer greater protection to the public, rather than ego extension for the inspector?

6. Will you consider with us the desirability of placing food protection in its proper framework as a matter of first importance to all Americans, not just to those who eat in restaurants, thus helping us to build a better, healthier, and safer way of life for our people?

Simply stated, the National Restaurant Association believes that there are common goals and objectives which can join us in a mighty effort to upgrade the thinking of people in management and improve the facilities which exist to serve the public.

Let both groups join together in the thought that great achievements begin in the common purposes of men, and that real leadership demands the best and the finest in the realm of thought. A better way of life can be guaranteed by our two groups as we move forward alongside each other toward a single common objective. The National Restaurant Association recognizes your seriousness of purpose and the high degree of dedication that has been exhibited by men and women in your field over and over again. You are to be congratulated on your accomplishments and every good wish goes with you in your daily life and work.

FARM BULK TANK SEDIMENT TESTING[1]

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Studies were made on 1281 farm bulk tanks, selected at random in 29 states, to determine the amount of sediment in bulk farm milk. The studies showed excessive sediment; 10.7% of the bulk farm tanks had a sediment test grade of No. 4 (2.5 mg. or over); and 17.5% were grade No. 3 (1.0 to 2.4 mgs). As sediment testing of farm bulk milk is not practiced as a standard procedure, it is apparent that producers have become careless in controlling those factors which are important in keeping extraneous matter in milk to a minimum. Milk in a farm bulk tank can be tested for sediment regularly and with ease by the use of a one pint tester with agitated samples delivered to the milk plant laboratory by the hauler. Sediment tests graded No. 3 or No. 4 can be followed up by the fieldman. Tests can be made at the farm in the presence of the producer (using a bulk tank tester, now commercially available), and action may be taken if indicated.

A standard off-the-bottom method of testing for sediment in milk in 10 gallon cans has been mandatory in many states and has long been recognized as a useful and necessary tool in obtaining clean milk (*1, 2, 3, 4*). March (*5*) has stated that one of the quality control tests which should be run routinely on all milk supplies is the sediment test, but with the advent of the farm bulk tank, several new factors have entered the picture and the conventional 1-pint tester, commonly used for testing milk in 10 gallon cans, was not practical.

Liska and Calbert (*6*) and Watson (*7*) have argued in favor of a mixed sample for sediment testing milk in bulk tanks. Some of Liska and Calbert's points in favor of a mixed sample are as follows:

"The ratio of bottom surface area to the total volume varies with type and size of farm bulk milk tank."

"The design of the tanks to allow for complete drainage of milk causes sediment to settle out in an uneven pattern."

"On many farm holding tanks the mechanical agitator is set in operation, whenever the refrigeration mechanism is in operation. This does not allow a definite period of quiescence needed for settling out sediment."

"There is difficulty in using the standard off-the-bottom sediment tester because the depth of farm bulk tanks, in some cases, exceeds the overall length of the sediment tester. This adds to problem of getting representative results."

In our preliminary work, the Lintine sediment test disk often plugged with the cold milk encountered in bulk tanks before the entire one gallon sample (or 1 pint per 1/8 square inch of filter area) had been filtered. This was due to the fact that 8 times as much milk must be filtered per square inch of filter area as compared to the off-the-bottom test. When the milk is cold, the congealed butter fat interferes with its passage.

Methods and Results

Because of difficulty in testing cold milk, and in view of studies by Jensen and Jokay, (*8*) a bulk tank sediment tester (sediment tester No. 1 used in this study) was developed and designed to sediment test a one-gallon mixed sample. In the one-gallon test both heat and pressure are utilized to overcome plugging by cold milk. Our studies with the one-gallon tester have shown that 12°F. to 15°F. increase in temperature is adequate to prevent plugging.

A total of 814 bulk tank tests were made in 22 states using the gallon tester with the built in heater. No plugging from cold milk occurred, but abnormal milk, such as that due to mastitis or leptospirosis infections, or excessive sediment, could plug the sediment test disk.

Further tests were made on an additional 467 farm bulk tanks using the one-gallon tester as well as other testers. Thus, a total of 1281 tests were made. All tests were graded in accordance with American Public Health Association Standards of 1953 (*9*). For convenience in identification, readings were changed from milligrams to grades as follows:

0.0 mgs	=	Grade No. 1
0.1 – 0.5 mgs	=	Grade No. 2
0.6 – 2.4 mgs	=	Grade No. 3
2.5 mgs or over	=	Grade No. 4

Producers were not advised as to when a call would be made. Farms, including some with pipelines, were selected from 29 states and 68 milk sheds. A total of 1281 farm bulk tanks were represented. Sediment tests were graded by competent fieldmen, sanitarians, or laboratory technicians. The sediment test grades on the milk from these 1281 tanks were as follows:

Grade No. 1—195 Tanks—15.2%
Grade No. 2—725 Tanks—56.6%
Grade No. 3—224 Tanks—17.5%
Grade No. 4—137 Tanks—10.7%

(See figures 1 and 2 for breakdown on milk for fluid and manufacturing purposes).

On 439 of the 1281 tanks tested, a 3-pint tester (tester No. 3 see below) employing heat and pres-

[1]Presented at the 46th Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Glenwood Springs, Colorado, August 26-28, 1959.

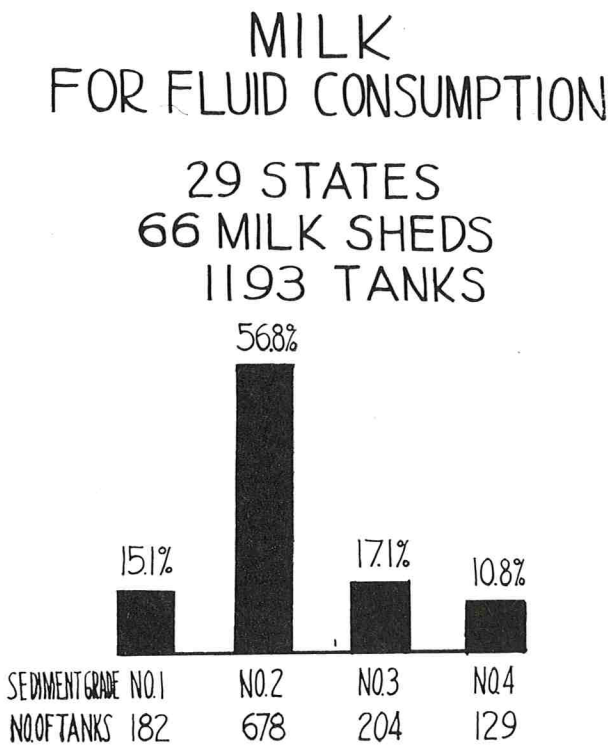

Figure 1. Sediment test results on milk for fluid consumption.

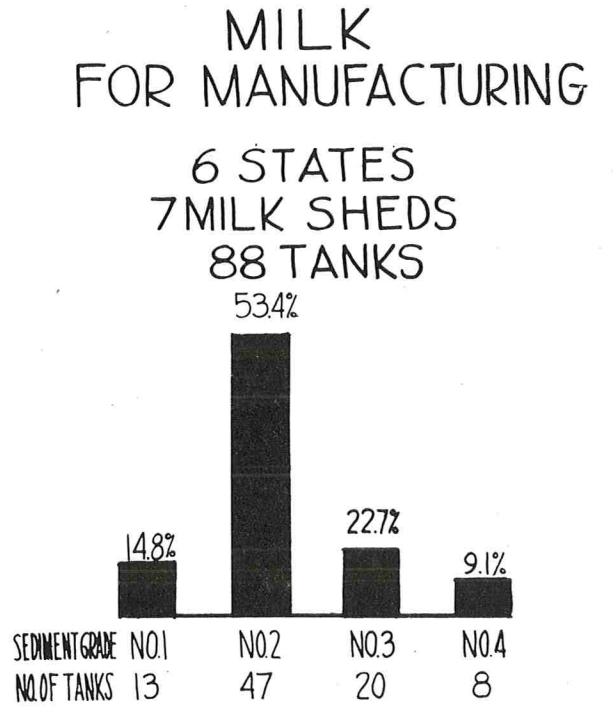

Figure 2. Sediment test results on milk for manufacturing purposes.

sure, as well as a one-pint laboratory tester (Tester No. 4), were used at the same time as the one-gallon tester No. 1. Proportionally smaller areas of the test disk were used when a smaller sample was tested, as follows:

1 Pint	0.4" _____dia.	.125 square inches
3 Pint	0.6875" _____dia.	.37122 square inches
1 Gallon	1.0" _____dia.	.9940 square inches

The three testers gave the same test grade on 85% of the tanks tested.

Additional studies utilizing testers of different design

In additional tests on milk in farm tanks, five different testers (see below) were used in a special study on 28 of the 1281 farm bulk tanks. For these tests, a 5-minute period of milk agitation was used before obtaining an agitated sample.

SEDIMENT TESTER NO. 1

This sediment tester was designed to draw automatically a 1-gallon sample of milk from the bulk tank, heating the milk with a tubular heater to approximately 55°F. before putting it through the Lintine sediment test disk. Sample removal required 2½ minutes. The sanitary design of the tester allowed the sample to be returned to the tank without contamination. This partciular unit was used for all of the probing tests inasmuch as it was the only tester designed for such an operation. The milk was pumped through the full one square inch area of the 1¼" Lintine sediment test disk.

SEDIMENT TESTER NO. 2

This sediment tester was designed to draw a 1-gallon sample through the Lintine sediment test disk by means of vacuum. The sample was obtained by dipping from the top of the milk. Samples were warmed to 65°F. by placing them in a container and then in a pail of hot water for a few minutes. The sample then was drawn through the full 1-square inch area of the Lintine sediment test disk.

SEDIMENT TESTER NO. 3

This sediment tester was designed to withdraw a 3-pint sample of milk into a container which had been evacuated by means of a manual pump. The milk was then heated to 65°F. by a blanket heater placed around its container. The sample then was pumped through a 0.375 square inch area of the Lintine sediment test disk.

SEDIMENT TESTER NO. 4

This was a laboratory type sediment tester utilizing an aspirator to draw a 1-pint sample of milk through the Lintine sediment test disk. The test area of the disk was 0.125 square inch (0.40" diameter). The sample was obtained by dipping one pint from the top of the milk into a container and heating to approximately 85°F. before testing.

SEDIMENT TESTER NO. 5

This tester was a standard one-pint gun with a specially adapted head to provide either the full one square inch of area of the "reduced" (1/8 square inch) area.

The outlet sample was obtained by drawing the milk from the outlet valve. Both agitated and unagitated samples were taken at this point.

TABLE 1—ONE-PINT SEDIMENT TESTS RESULTS FROM DIFFERENT LOCATIONS

	Tank type: Flat bottom				Tank type: Round bottom		
	Location:				Location:		
	Front left	Front right	Rear left		Front left	Front right	Rear left
Tank No.	Sediment Grades			Tank No.	Sediment Grades		
1.	3	3	3	1.	3	2	3
2.	3	3	3	2.	2	2	2
3.	4	4	4	3.	4	3	3
4.	4	4	4	4.	2	2	2
5.	4	4	4	5.	4	4	4
6.	4	4	3	6.	4	4	4
7.	3	3	3	7.	3	3	3
8.	4	4	4	8.	4	4	4
9.	2	3	3	9.	4	4	4
10.	—	4	4	10.	4	4	4
				11.	3	3	3
				12.	3	3	3
				13.	4	4	4
				14.	3	4	4
				15.	2	—	2
				16.	3	—	3
				17.	2	—	2
				18.	2	—	2

TABLE 2—SEDIMENT TEST RESULTS FROM DIFFERENT MILK LEVELS (TESTER NO. 1)

	Sediment grades		
Tank Number	Probed (Agitated)	Low (Agitated)	High (Agitated)
1	—	3	2
2	—	2	2
3	4	4	4
4	3	2	2
5	4	4	4
6	3	3	3
7	4	3	3
8	—	2	2
9	4	3	3
10	—	2	2
11	2	2	2
12	2	2	2
13	4	3	3
14	2	2	2
15	3	3	3
16	4	3	3
17	2	2	2
18	—	2	2
19	—	3	3
20	—	2	2
21	—	3	3

The 28 farms were selected by "screen testing" a large group of producers as follows: A one-pint sample was brought in by the hauler and sediment tested using tester No. 4 (one pint). The tanks showing the more severe sediment tests were selected in order that enough sediment would be present for the tests to indicate the difference between the various types of tests and testing procedures.

A series of tests were made to determine the effect of several testing factors as follows:

1. Using the one-pint sediment teser (Tester No. 4), the study on 28 tanks indicated that the location from which an agitated sample was taken had no bearing on the sediment test. Results are shown in Table 1. The one-pint samples were dipped from 3 horizontal positions in the tank: (*a*) the front (valve end), left side; (*b*) front end, right side; and (*c*) rear end, left side. (See Figure 3).

2. Studies indicated that the depth from which the sample was taken caused little if any variation in the sediment test. Tests were taken using the one-gallon sample (Tester No. 1) through an area of 1.0 inch of a Lintine sediment test disk. Samples were drawn through a tube from: (*a*) within six inches of the tank bottom, and (*b*) within six inches of the top of the milk in the tank, yet not dipped from the tank. Twenty-one tanks were compared by taking tests from the two positions in the tank, *i.e.*, high and low in the milk. In 20 cases, the two tests graded the same. The results are shown in Table 2.

3. The results of 57 sediment tests run at 65° F. and 85°F. using the 3-pint and the 1-pint testers, respectively, are shown in Table 3. Identical sediment test grades were obtained in 41 of the 57 tests (71.9%).

4. Table 4 shows the sediment test results on 30 bulk tank samples using 1-gallon, 3-pint, and 1-pint samples. In no case was there a variation of more

TABLE 3—EFFECT OF TEMPERATURE ON SEDIMENT TEST RESULTS

Tank No.	Temperature and sample size: 65°F. 3 Pint	85°F. 1 Pint	Tank No.	Temperature and sample size: 65°F. 3 Pint	85°F. 1 Pint
	(grade)	(grade)		(grade)	(grade)
1	4	3	1	4	4
2	4	3	2	3	4
3	4	4	3	4	4
4	4	3	4	4	4
5	4	4	5	4	4
6	4	4	6	3	4
7	4	4	7	4	3
8	4	4	8	4	4
9	3	3	9	2	2
10	4	4	10	3	3
11	3	3	11	4	4
12	4	3	12	3	2
13	3	2	13	3	2
14	4	3	14	2	2
15	3	3	15	2	2
16	3	2	16	2	2
17	3	3	17	3	3
18	2	2	18	3	2
19	2	2	19	3	3
20	4	4	20	2	2
21	4	3	21	4	4
22	3	3	22	3	3
23	2	2	23	2	2
24	3	3	24	4	4
25	3	3	25	4	4
26	3	3	26	4	4
27	4	4	27	3	2
28	2	2	28	4	3
29	4	4			

than one grade due to the size of sample.

5. For unagitated samples (both outlet and probed) the ratio of volume of milk to Lintine disk area was 8 to 1. The 8 to 1 ratio, was however, established for agitated samples. With the "off-the-bottom" test on unagitated samples, only one pint should be filtered through one square inch of Lintine disk area. A one-gallon (per square inch) unagitated sample from the outlet may show a quantity of sediment which may be used to impress the dairyman, but should not be graded using the APHA standard grading chart since this chart is based on only one pint per square inch for an unagitated test sample.

6. Further tests were made on probed unagitated milk using Tester No. 1 both at front (valve end) and rear of bulk tanks, and on agitated milk using Testers No. 1 and No. 2. The results indicated that no similarity existed between tests on a suspended agitated sample and on a probed unagitated sample.

7. A study of the time necessary to draw a one-pint sample of milk heated to 85°F. was made using the aspirator type laboratory sediment tester (Tester No. 4) with city water pressure (30 lbs. p.s.i.) which yielded a vacuum of approximately 16 to 18 inches. The quantity of sediment seemed to have little effect on the time necessary to draw the one-pint sample through the Lintine sediment test disk.

CONCLUSIONS

These studies show excessive sediment in farm bulk tank milk. Of the milks tested, 10.7% were graded No. 4 (2.5 mgs or over), and 17.5% were graded No. 3.

Sediment test results were not affected by size of sample provided the proper relationship of volume to filtering area was maintained. Since sediment testing of milk in farm bulk tanks is not yet generally standard procedure, it would appear that the producers have become careless in controlling those factors which are important in keeping extraneous matter in milk to a minimum. Observation of used filter media will provide the dairyman with a means of detecting excessive extraneous matter in milk and in

TABLE 4—EFFECT OF SIZE OF SAMPLE ON SEDIMENT TEST GRADE

Tank No.	Tester No. 2 65°F., 1 gallon	Tester No. 3 65°F., 3 pint	Tester No. 4 85°F., 1 pint
	(grade)	(grade)	(grade)
1	3	4	3
2	3	4	3
3	3	4	4
4	4	4	4
5	4	4	4
6	4	4	4
7	—	4	4
8	—	4	—
9	—	4	3
10	—	3	3
11	—	4	4
12	—	3	3
13	—	4	3
14	—	3	2
15	—	4	3
16	—	2	2
17	—	4	4
18	—	3	4
19	—	3	3
20	4	4	4
21	4	4	4
22	3	3	4
23	—	4	3
24	—	4	3
25	3	3	2
26	3	4	4
27	3	3	3
28	—	3	3
29	—	2	2
30	—	2	2

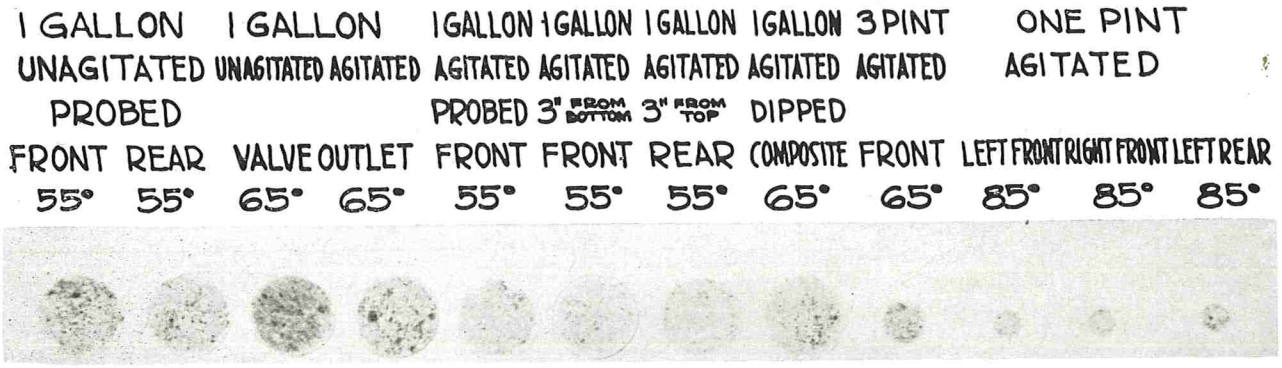

Figure 3. Sediment tester disks from one of the farm bulk tanks in this study using four types of testers with the milk taken from different locations.

detecting abnormal milk due to mastitis and other infections.

Milk may be tested for sediment regularly and with ease by the use of a one-pint tester with samples delivered to the milk plant laboratory by the hauler. Those producers with sediment tests graded No. 3 or No. 4 can be visited by the fieldman and sediment tests can be made at the farm in the presence of the producer, and action may be taken if indicated.

ACKNOWLEDGEMENTS

We express our appreciation to all the milk plant personnel, fieldmen and sanitarians in all the states who were so generous with their time and help, not only in the laboratory, but on the farm in all types of weather and hours and to our Research and Development Department for assistance in programming, field help, development and maintainance of test equipment and materials.

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COMMITTEES OF THE INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., FOR 1960

COMMITTEE ON APPLIED LABORATORY METHODS

Objectives

To study new laboratory procedures and bacteriological problems, to evaluate both published and unpublished data, and other technical problems and to present conclusions which will be helpful to the sanitarian in the conduct of his work.

Members

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COMMITTEE ON BAKING INDUSTRY EQUIPMENT

Objectives

The objectives of this committee are to provide consultative assistance to the Baking Industry Sanitation Standards Committee in the development of standards for items in the Baking Industry.

Members

Vincent T. Foley, *Chairman*, Chief of Food, City Health Department, Kansas City 6, Mo.

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COMMITTEE ON COMMUNICABLE DISEASES AFFECTING MAN

Objectives

To study problems related to those diseases communicable to man through the consumption of foods, including milk and milk products, meat, poultry, and shellfish, and to recommend specific measures that can be taken by the sanitarian to control such diseases.

Members

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COMMITTEE ON DAIRY FARM METHODS

Objectives

To study dairy farm methods and procedures, to determine the sanitary problems involved, and to make recommendations for the solution of such sanitary problems, and for the improvement of dairy farm methods which have a relationship to the sanitary quality of milk.

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COMMITTEE ON EDUCATIONAL AND PROFESSIONAL DEVELOPMENT

OBJECTIVES

First, to develop plans and to devise methods whereby the Sanitarian can more fully gain recognition as a professional worker in public health; secondly, to recommend standards of education, training and experience designed to establish desirable professional qualifications to the end that the title Sanitarian will denote adequate preparation for professional work and attainment, and thirdly, to continue and further the scholarship program.

MEMBERS

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COMMITTEE ON FOOD EQUIPMENT

OBJECTIVES

To participate with other health organizations and industries in the formulation of sanitary standards for food equipment. Specifically, the functions of this committee include: (*a*) cooperation with other health agencies and industry, under the auspices of the National Sanitation Foundation, in the joint development of NSF Standards for Food Service Equipment; (*b*) cooperation with other health agencies and industry, under the auspices of the Automatic Merchandising Health and Industry Council, in the joint development of AMHIC Evaluation Manual for Food and Beverage Vending Machines; (*c*) when directed by the Executive Board, to cooperate with other health groups and industry in the development of sanitary standards for food equipment; and (*d*) to present to the membership at the annual meeting those standards which the Committee recommends be endorsed or approved by the Association.

MEMBERS

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COMMITTEE ON FROZEN FOOD SANITATION

OBJECTIVES

To study conditions and practices within the frozen food industry, to determine the sanitary problems involved which might contribute to a public health hazard, and to make recommendations for the solution of such problems.

MEMBERS

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COMMITTEE ON MEMBERSHIP

OBJECTIVES

To make every effort to increase the membership of the organization by bringing to the attention of all qualified persons the advantages of belonging to the International Association of Milk and Food Sanitarians, Inc., and to interest State milk and food sanitarian's organizations in the advantages of affiliation with the Association.

MEMBERS

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COMMITTEE ON ORDINANCES AND REGULATIONS PERTAINING TO MILK AND DAIRY PRODUCTS

OBJECTIVES

To review and study the provisions of sanitary ordinances and regulations pertaining to milk, milk products, and frozen desserts; to evaluate data on research findings relative to the sanitary and public health significance of the specific requirements of ordinances and regulations; and to prepare for submission to the members of the Association recommendations for changes in existing and proposed ordinances and regulations.

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COMMITTEE ON RECOGNITION AND AWARDS

OBJECTIVES

This committee is charged with the responsibility of implementing those objectives of the Association concerned with: (*a*) recognition of individual milk and food sanitarians whose achievements have contributed greatly to the public health and welfare of their communities; and (*b*) recognition of those members of the Association who have, through distinguished service, contributed greatly to the professional advancement and growth and reputation of the International Association of Milk and Food Sanitarians, Inc.

The Committee receives and reviews nominations for the annual Sanitarian's Award, and has full responsibility for the election of the recipient. The Committee also receives and reviews recommendations on candidates for the annual Citation Awards, and counsels with the Executive Board relative to the selection of the recipients. It is also responsible for handling all matters pertaining to the presentation of awards, publicity and other related items.

MEMBERS

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COMMITTEE ON RESEARCH NEEDS AND APPLICATIONS

OBJECTIVES

The objectives of this committee are: (*a*) to serve the field

sanitarian as a clearing house for new ideas and practices which would enable a more efficient discharge of their duties; (*b*) to coordinate its activities with those of a similar committee of the American Public Health Association (Engineering & Sanitation Section); and (*c*) to ascertain the needs of the membership for specific information on given problems and to find the best method of disseminating information obtained by the committee.

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COMMITTEE ON SANITARY PROCEDURES

OBJECTIVES

To participate jointly with the Sanitary Standards Sub-Committee of the Dairy Industry Committee and the Milk and Food Branch, U. S. Public Health Service, in the formulation of 3A Sanitary Standards for Dairy Equipment. Specifically, the functions of this committee are: (*a*) to receive, consider and comment on proposed sanitation standards for dairy equipment submitted by the Sanitary Standards Subcommittee; (*b*) to bring to the attention of the Sanitary Standards Subcommittee items of dairy industry equipment and methods for which formulation of sanitary standards appear desirable; and (*c*) to cooperate with the Dairy Industry Committee, the U. S. Public Health Service, and health officials in attaining universal acceptance of the sanitary standards upon which mutual agreement has been reached.

MEMBERS

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AMENDMENT TO THE 3-A SANITARY STANDARDS FOR STAINLESS STEEL AUTOMOTIVE MILK TRANSPORTATION TANKS FOR BULK DELIVERY AND/OR FARM PICK-UP SERVICE

Serial #0501, (Sept. 1954)
Serial #0503

In keeping with the provisions of the 3-A Sanitary Standards For Stainless Steel Automotive Milk Transportation Tanks For Bulk Delivery And/Or Farm Pick-up Service, published in September 1954, this incorporates an amendment to the final paragraph of Section D (4) of that standard.

The last paragraph of D (4) is amended to read as follows:

4. ----------

Manholes shall be so located that in no case shall either end of the tank be more than 18 feet, 6 inches from a manhole opening.

Effective Date: This amendment shall become effective July 5, 1960.

A DIRECT MICROSCOPIC METHOD FOR DETECTING ANTIBIOTIC ACTIVITY IN MILK[1]

B. J. Liska[2]

Florida Agricultural Experiment Station

Gainesville, Florida

(Received for publication November 5, 1959)

A method for detecting antibiotic activity in milk using microscopic examination is presented. The *Streptococcus thermophilus* culture is exposed to the milk samples for 60-90 min. at 37°C. A methylene blue stain is prepared and examined for changes in morphology or reduction in clump count as compared to a control in antibiotic free milk. Abnormal enlargement or elongation of cells or a 50% reduction in clump count as compared to the control indicates antibiotic activity. Minimum concentrations of various antibiotics detected are: penicillin 0.015 units per ml; bacitracin 0.01 units per ml; terramycin 0.15 micrograms per ml; aureomycin 0.15 micrograms per ml and streptomycin 0.75 micrograms per ml. The test procedure is not affected by normal residues of sanitizers or bacteriophage. The stained milk films can be kept as a permanent record. Leucocycte counts can be made on the stained milk films during microscopic examination.

During recent years the incidence of antibiotics in the milk supply has received considerable attention. Welch *et al.* (*9*) reported that results of a nationwide survey in 1956 revealed 5.9% of the fluid milk samples tested contained from 0.0034 to 0.55 units of penicillin per milliliter of milk. Another 1.0% of the milk samples contained other antibiotics such as bacitracin or one of the tetracyclines. The Federal Food and Drug Administration has taken the attitude, as reported by Durbin (*3*), that antibiotics in milk pose a public health hazard and any milk containing antibiotic residues is adulterated.

A rapid platform test for detecting antibiotics in the raw milk supply would be ideal. The use of dye markers in antibiotic preparations has been suggested as a rapid means of detecting antibiotics in milk (*4*). Several tests have been proposed in the past which are based on the inhibition of acid production or bacterial growth measured by acid titration, inhibition of dye reduction or zones of inhibition on agar media (*1, 6, 8*). For a measurable change to occur in any of these bacterial methods, a considerable amount of bacterial growth is necessary. By using direct microscopic examination, a change in bacterial populations can be detected in less time than is required by present methods. Several research workers (*2, 5, 10*) have observed that some antibiotics, especially penicillin, cause changes in the morphology of lactic cultures in a relatively short time. These morphological changes are readily detectable using a methylene blue staining procedure and microscopic examination (*5*). The purpose of this study was to use this information to develop a direct microscopic method for detecting antibiotic activity in milk.

Materials and Methods

Six pure cultures of *Streptococcus thermophilus* were obtained from commercial culture supply organizations. The one culture most sensitive to penicillin and the other antibiotics was used in this study. This culture was propagated in antibiotic free nonfat dry milk which had been reconstituted to 10% solids and heated at 121°C. for 12 minutes in the autoclave. The culture was normally transferred daily, using 0.1% inoculum, with a 12 to 14 hour incubation period at 37°C. For reserve stocks, 1-ml. portions of the freshly coagulated *S. thermophilus* culture were transferred to nine ml. of sterile skim milk medium in sterile screw cap test tubes and stored at -10 to -15°F. A frozen 10-ml. portion of culture could be thawed in ice water, incubated at 37°C. for 10-12 hrs. and would normally have sufficient activity for use in the test. This frozen supply of culture would eliminate daily transfers in cases where culture would be needed once or twice a week for testing milk.

Antibiotic standards were prepared from pure crystalline forms of the antibiotics[3] in sterile distilled water buffered to a pH of 7.0-7.2. The antibiotic solutions were used as prepared or were dispensed in 1-ml. portions into sterile screw cap test tubes and stored at -10 to -15°F. until needed. Any frozen reserves not used within two weeks were discarded. The frozen antibiotic solutions were thawed at room temperature and further diluted in sterile buffered distilled water just prior to use in the test.

To determine antibiotic activity against the test culture, milk films usually were prepared and stained according to the Breed direct microscopic procedure (*1*). The more rapid screening techniques using the

[1]Florida Agricultural Experiment Station Journal Series, No. 1005.

[2]Present address: Department of Dairy Husbandry, Purdue University, Lafayette, Indiana.

[3]Antibiotics furnished by Chas. Pfizer and Co., New York.

calibrated loop for measurement and the Newman-Lampert one dip stain also was used to determine whether it was sufficiently accurate for this test procedure. The microscopes used had microscopic factors between 300,000 and 500,000.

Developing the Test Procedure

The first step in developing the test procedure was to determine the size of inoculum to use. Preliminary work indicated it would be desirable to use sufficient inoculum in the control to yield an average clump count per microscopic field of 10 to 20, after a 60 to 90-minute incubation period at 37°C. With the culture used, 0.02% inoculum (0.2 ml. of a 1-10 dilution per 10 ml. total volume in the test) gave this desired range. Dilution of the culture facilitated accurate measurement of the inoculum used.

To determine the length of incubation time, intervals of 30, 45, 60, 75, 90 and 120 minutes were used in preliminary work. The rate of growth of the test culture (activity) is the basis for determining the length of the incubation period. The incubation time must be long enough to allow sufficient growth to occur to obtain a detectable difference in clump count between the control and the actual test.

Test Procedure

1. Pipette 9.8 ml. of milk samples to be tested into separate sterile screw cap test tubes. Prepare a control test for each set of 10 samples using raw milk or nonfat dry milk reconstituted to 10% solids known to be antibiotic free.

2. Heat the test samples and control at 80°C. for 3 minutes and cool to 37°C.

3. Dilute the coagulated test culture 1-10 with antibiotic free sterile 10% nonfat dry milk and hold at 37°C. for 10 minutes. Add 0.2 ml. of diluted culture to each tube including the control, giving a total volume of 10 ml. per test.

4. Invert the tubes five times to mix the contents, and incubate the tubes in a water bath at 37°C. for 60-90 minutes. Mix the tests at 30 minute intervals by inverting each tube three times.

5. At the end of the incubation period, shake the test samples and controls according to directions given for shaking dilution blanks for the Standard Plate Count (*1*).

6. Prepare a milk film from each test sample and the control using either a calibrated syringe or calibrated loop for measurement.

7. Stain the milk films using the acid water free methylene blue or the one dip Newman-Lampert technique.

8. Examine the stained milk films under oil immersion, using a microscope with a microscopic factor between 300,000 and 500,000. Count the bacterial clumps in five fields at well separated points on the stained control film and obtain an average clump count per field. In a similar manner make clump counts on the stained films from the other test samples, after checking for abnormal distortion and enlargement of bacterial cells.

9. Any sample which causes cell distortion or enlargement of the test culture, or has a clump count per field of less than 50% of the clump count per field for the control, has antibiotic activity present.

RESULTS AND DISCUSSIONS

Streptococcus thermophilus was chosen as the test culture because it is inhibited by lower concentrations of antibiotics than S. *lactis* or most other lactic dairy cultures (*6*). The concentrations of antibiotics detected by this method are determined by the sensitivity of the test culture; its activity and the length of the incubation period used are also involved.

The generation time of S. *thermophilus* under the conditions used in the test procedure should be between 20 and 30 minutes (*11*). Using a ten minute tempering period, two or three cell divisions should occur during the 60-90 minute incubation period. This is sufficient to reveal a difference in clump count on a stained milk film from a control and a sample which has antibiotic activity.

Table 1 contains data showing the minimum concentration of various antibiotics detectable when using a S. *thermophilus* culture. A 60-minute incubation period is sufficient to detect the concentrations of antibiotics which would interfere with the manufacture of cultured dairy products; longer incubation periods increase the sensitivity of the test procedure. S. *lactis* cultures can be used as the test cultures only if concentrations of penicillin above 0.05 units per ml. of milk are to be detected (*5*).

At certain concentrations penicillin causes the S. *thermophilus* organisms to undergo abnormal en-

TABLE 1—MINIMUM CONCENTRATIONS OF ANTIBIOTICS DETECTED IN HEAT TREATED MILK USING S. *Thermophilus* CULTURE

	Length of incubation period	
Antibiotic	60 min.	90 min.
Penicillin G (Potassium)	0.020 u/ml.	0.015 u/ml.
Aureomycin	0.2 γ/ml.	0.15 γ/ml.
Terramycin	0.2 γ/ml.	0.15 γ/ml.
Bacitracin	0.020 γ/ml.	0.01 γ/ml.
Chloromycetin	1.0 γ/ml.	0.75 γ/ml

Figure 1. Methylene blue stains showing changes in morphology of *S. thermophilus*, caused by penicillin, after 1 hr. exposure at 37°C. Magnification 1350X 1. = Control. 2. = 0.05 units/ml. 3. = 0.5 units/ml.

largement and elongation. This is evident after a 30 to 45-minute period of active growth in the presence of low concentrations of penicillin (5). Figure 1 indicates the type of abnormal morphology visible in a methylene blue stain of the penicillin inhibited culture after 60 minutes of incubation at 37°C. The comparison shows that changes in morphology are more evident at a penicillin concentration of 0.5 units per ml. than they are at 0.05 units per ml. Perhaps this is due to a more complete inhibition of the metabolism of the bacterial cell at the higher antibiotic concentration. It was observed that bacitracin causes morphological changes similar to those caused by penicillin. Aureomycin and terramycin cause some abnormal morphological changes in the test organisms, but these changes require higher concentrations of these antibiotics and also more time for development (7).

By checking, for both morphological changes and a reduction in clump count, inhibition by the various antibiotics tested was easily detected. This method is useful in distinguishing among some antibiotics since penicillin and bacitracin can be distinguished from most other antibiotics by the distinct morphological changes they cause in the test organisms.

Table 2 contains typical results obtained by three individuals on one set of unknown samples prepared with standard antibiotic solutions. Considering the inherent variations in the direct microscopic procedure, results are in excellent agreement. Two of the individuals had only a minimum of experience in the use of the microscope.

A comparison between results obtained on the same set of test samples using a calibrated loop and a calibrated Breed syringe for measurement of milk for the milk films was made. Little difference in

TABLE 2—TYPICAL RESULTS OBTAINED BY THREE INDIVIDUALS ON ONE SET OF MILK SAMPLES PREPARED USING VARIOUS CONCENTRATIONS OF STANDARD ANTIBIOTIC SOLUTIONS[a]

Antibiotic and Concentration/ml.	Average Clump count per field by three operators: A		B		C	
Control A[b]	18		19.8		15.4	
0.1 u/ml. penicillin	1.6	swelled[d]	1.2		1.0	swelled
0.02 u/ml. penicillin	5.8	swelled	3.4	swelled	7.2	swelled
0.2 γ/ml. aureomycin	3.6		6.8		4.8	
0.2 γ/ml. terramycin	5.4		6.0		6.6	
0.5 γ/ml. terramycin	2.0		2.0		2.2	
0.5 γ/ml. aureomycin	1.0		1.4		1.0	
0.05 u/ml. penicillin	1.4	swelled	2.4	swelled	3.6	swelled
0.1 γ/ml. aureomycin	7.4		8.4		6.6	
Control B[c]	18.2		20.0		21.4	
5.0 γ/ml. terramycin	1.8		1.0		2.2	
0.01 u/ml. penicillin	5.4	swelled	4.0		6.4	swelled
0.15 γ/ml. terramycin	6.0		6.2		3.8	
0.10 γ/ml. terramycin	17.4		18.6		16.2	
0.015 γ/ml. aureomycin	18.2		18.0		16.8	

[a]90 min. incubation at 37°C.; [b]Control A-raw whole milk; [c]Control B-10% NDM Media; [d]Indicates cell enlargement.

results was noted between the two methods of measurement. Both the methylene blue and the Newman-Lampert one dip stain worked satisfactory for staining the milk films. The use of the loop measurement and the one dip stain saved considerable time in the test procedure.

To determine if natural inhibitory substances in milk could be detected, one hundred samples of raw milk from individual cows, which had no antibiotic treatment for at least one month, were tested without using the heat treatment. Results indicated one of the samples caused slight inhibition which was not evident when the milk was retested after a heat treatment of 80°C. for 3 min. This indicates the method could be used on unheated milk to detect natural inhibitory substances.

Table 3 indicates the effect of sanitizers on the direct microscopic test procedure. Concentrations of active ingredients above 5 ppm for quaternary ammonium compounds are detected by the procedure. Higher concentrations cause a definite enlargement of bacterial cells much the same as penicillin and bacitracin. Chlorine must be present in amounts above 80 ppm and iodophors above 40 ppm to have any effect on the test. From these results, it appears that only quaternary ammonium compound residues could ever be present in sufficient concentrations to have a marked effect on the test.

Bacteriophage present in milk to be tested would not have any effect on the test since the incubation time is short and this would not allow sufficient time for bacteriophage to develop and cause inhibition of test culture. Care in transferring the test culture is necessary to avoid contamination with bacteriophage.

If a sample of milk being tested had prior bacterial growth, the count would have to be excessive before it would interfere, since the microscopic factor of microscopes used would be from 300,000 to 500,000. Any growth other than the typical *S. thermophilus* coccus forms can be distinguished when making the counts. These conditions have not caused problems in the test procedure since a 50% reduction in clump count over the control was established as necessary before a milk sample was suspected of antibiotic activity.

To further check the accuracy of the test procedure, 225 samples of raw milk were collected and tested for antibiotics by both the agar disc assay (*1*) and the direct microscopic methods. Excellent agreement between the two methods was obtained on all samples.

The direct microscopic method appears to have some advantages over present methods; the main disadvantage is the requirement of a microscope for performing the test. The method consumes less time than present methods, offers some possibility of distinguishing between antibiotics, offers a permanent record in the form of a stained milk film, and, if desired, leucocyte counts also can be made.

TABLE 3—EFFECT OF SANITIZERS ON THE TEST PROCEDURE

Sanitizer used (ppm active ingredients)	Average count per field after 90 min. at 37° C.
Control	17.2
Quaternary NH_4 compounds	
5	15.2 swelled
10	9.4 swelled
15	8.0 swelled
20	5.8 swelled
30	1.0 swelled
Chlorine (hypochlorite)	
20	17.0
40	17.8
80	10.2
120	7.0
Iodophor complex	
10	18.0
20	17.8
40	14.8
60	9.1
80	8.8

ACKNOWLEDGEMENT

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NEWS AND EVENTS

QUESTIONS AND ANSWERS

QUESTION:

Since the presence of pesticides in milk is taboo, and their presence in other foods must be kept below certain tolerance levels, what are some practical preventative measures that should be observed to minimize their appearance?

ANSWER:

Insects constantly attack man's food supplies, either while in development, process, or storage; in crops, timber, plants, warehouses, or on the hoof. It has been estimated insects cause losses of 4 billion dollars annually in the United States to food, fibre, forests and clothing. This is about 22 dollars per person direct loss. Some estimates have indicated 20-30 per cent of all food crops would be lost if certain treatments were not used; in many instances the food crops simply would not be available. Thus, to have food and fibre in the quantities we now enjoy, pesticide treatments must be employed. About 75 or more species of insects or mites are economic pests of forage crops.

Avoiding absolute presence of pesticides in foods or of presence of them above certain limits, requires understanding of their specific behavior characteristics. General rules are not always applicable, yet some general characteristics may be cited.

Certain pesticides when applied directly to animals such as cows will eventually be absorbed and transported with the milk system. Thus, for these known properties the use of the specific adverse pesticides must be avoided, and only those which are not so translocated used.

When forage crops are treated with certain pesticides, under certain conditions, residues may be carried through in the forage, and subsequently in the meat or milk.

In some instances, effective economic substitutes have not been found for certain pesticides which when carried through the forage, appear in the meat and milk. Hence, possible use of the valuable food forage is lost. An example is DDT which is used for marketable sweet corn, but the fodder of which cannot be used for dairy feed.

The registration and subsequent certification for use of chemical crop pesticides requires a full disclosure of data on the recommended conditions of their use. Information must be presented on the levels and frequency of application and periods of abstinance of application, such as intervals before harvest. The certification provides for use of the chemicals under the conditions stipulated, for within these conditions freedom from excess carry-over or absence from any carry-over, has been demonstrated as feasible. If these stipulated conditions of use are not followed there can occur possible excesses in the ultimate processed food or animal forage. The conditions of use may have to vary under conditions of climate; weathering of crops in an irrigated area is quite different from that where there is a heavy regular rain-fall. Application to leaf surface is quite different to that of a soil application. Recommendations are currently being made that growers of direct known food crops guarantee in writing that the use of pesticides has not been outside previously agreed upon stipulations.

Certain pesticides are known to be stable and to be carried over in soils for considerable periods of time. The persistence of a pesticide in a soil for 10 years has been cited; the accumulative residue from applications over a period of years likewise have been cited. More recently it has been shown there is possibility of a pesticide in the soil degrading into a form with higher levels of toxicity. It is well established that carry-over of pesticides in the soil can affect the flavor of certain vegetable crops grown in subsequent years. Consequently, a realistic approach should be given in appraising the potential effects of the pesticides, and since they are essential, to know as much as possible of their respective characteristics.

DR. CARL R. FELLERS, AUTHORITY ON FOOD, DIES IN CANADA

Dr. Carl R. Fellers, 66, internationally known food technologist and Associate Editor of the Journal of Milk and Food Technology, died suddenly Monday, February 23, at St. Ann's de la Pocatiere, Quebec.

Born at Hastings, N. Y. on October 4, 1893, he graduated from Cornell University in 1915 and received his Ph. D. from Rutgers University in 1918.

After five years in Government service as a bacteriologist where he was awarded a certificate of merit from the surgeon general, Dr. Fellers held the position of research bacteriologist with the National Canners Association until 1925 when he joined the University of Washington as an Associate Professor of Food Preservation. He came to the Massachusetts State College, now the University of Massachusetts, in 1926 as research professor of food technology and served as the head of the department from 1941 to 1957, when he retired.

During World War II, Dr. Fellers was post chemistry officer at Fort Devens and served as a lieutenant colonel, Q.M.C., in the Southwest Pacific theatre, where he acted as liaison officer with the Australian government. In recognition of this service, he was awarded the bronze star.

Dr. Fellers was an inventor of methods for the

pasteurizing of dry foods and the canning of Atlantic crabs. He was awarded the Babcock Award for work in food technology. He was a member of many research and scientific organizations, among which was the International Association of Milk and Food Sanitarians, the American Public Health Association, American Chemical Society, the Society of American Bacteriologists, a member of the American Fisheries Society of New York. He was a fellow of the A.A.A.S. and was one of the founders of the Institute of Technology, of which he was president in 1949. He was the author of many scientific and technical articles on chemistry, bacteriology and food technology.

MICHIGAN HOLDS SUCCESSFUL ANNUAL MEETING

This year's annual conference of the Michigan Association of Sanitarians, held on March 1, and 2 at Kellogg Center, Michigan State University, was one of the most successful ever held by the association. Attendance was over double the number attending last year's meeting and there was a general expression of satisfaction on the part of the membership with the meeting as a whole.

The exact reason or reasons for this surprising upturn in attendance has not been definitely determined. Whether it was due to changing the meeting date to a month earlier than has been the custom in the past, or whether a particularly outstanding program encouraged the turn out can only be surmised. Certainly the enthusiasm evident at this gathering was very gratifying to those who had worked so hard to put the conference together. A resolution expressing this feeling was passed at the business meeting and was conveyed to the program committee and to the conference planners at Kellogg Center.

Armin Roth, Wyandotte Chemical Co., (left) presenting the Michigan Sanitarian's Award to Art Harvey of Cadillac.

The business meeting was held Tuesday afternoon and featured the election of officers. Elected to the presidency was Ronald Leach, Division of Foods and Standards of the Department of Agriculture; Vice President, Armin Roth of the Wyandotte Chemicals Corp.; and the 2nd Vice President, Ralph Florio, Pontiac Health Department. Robert Lyons was re-elected as Secretary-Treasurer and a new addition to the Board of Directors was Ed Wykes, Grand Rapids Health Department. All other members of the board were retained by the members.

Sanitarian of the Year

The presentation of this year's Sanitarian's Award was a particular joy inasmuch as it went to one of the truly fine veterans in the field of Public Health.

Arthur J. Harvey, of Cadillac, with many years of service with the District Health Department at Cadillac, was this year's recipient.

To list Art's many activities and services to his profession and to his community would require a special edition of the paper. Whatever activity contributes to the growth of a community, he has had a part of that activity. Whatever contributes most to the elevation of a profession he has been a willing contributor. To honor such as Art reflects merit on us all. Let's say once again, "Congratulations, Art!"

DISA HONOR PLAQUE GOES TO ROBERTS EVERETT FOR FOUR DECADES OF SERVICE

Roberts Everett, Executive Vice President of Dairy Industries Supply Association, was the recipient of the 12th DISA Honor Plaque at DISA's 41st Annual Meeting, March 31, 1960, at the Edgewater Beach Hotel in Chicago.

The veteran supplier-equipper executive, who first came to work for DISA in 1919, will step into semi-retirement in July.

The DISA Honor Plaque is awarded occasionally by the DISA Board to those persons who have made exceptional contributions to the trade association. In making the presentation, D. G. Colony, Manton-Gaulin Manufacturing Company, Inc., DISA's President, said:

"DISA was chartered in 1912, and struggled along as an informal club until 1919, when a young air-force-veteran and newspaperman named Roberts Everett came along to breathe life into the loose confederation of firms selling to the ice cream industries. Through his executive leadership and devotion, DISA grew into the indispensable arm to all of us that it is.

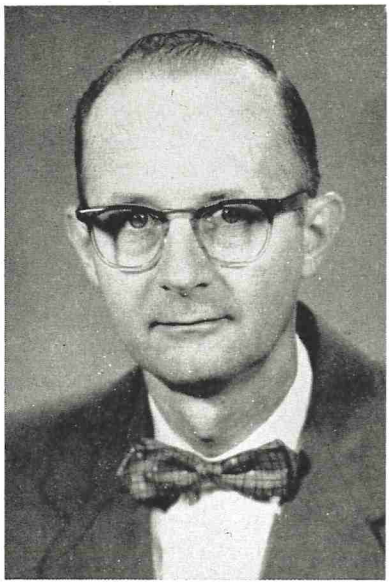
"Not a single activity undertaken by the association has ever failed to have his closest attention. His mind has grasped a thousand divergent strains of thought in one instant, and translated them into understanding for us all in the next.

"This is the last annual meeting Bob will attend in his role as Executive Vice President; he will step into semi-retirement this coming July. I say semi-retirement, because he will continue to serve DISA as a consultant for a contracted period of years, and, I hope, many years more.

"More than any other person's, DISA is Roberts Everett's monument."

Mr. Everett was also presented a parchment citation by the Board of Directors, containing a resolution saluting his record of service. This presentation was made by S. E. Crofts, Batavia Body Company, Incorporated, DISA's Chairman of the Board.

PUSCAS NAMED DIRECTOR OF HEALTH AND WELFARE FOR OAK RIDGE



Edward J. Puscas

Recently appointed to a new position at Oak Ridge, Tennessee is Edward J. Puscas. He has been named the first Director of Health and Welfare for that City.

Oak Ridge, famous as the site of early developments in atomic energy, and still a leading center in this field, was, until recently, operated wholly by the Federal Government through the Atomic Energy Commission. Citizens of Oak Ridge expressed their desire for self government, which was granted, and by June 1. 1960, this will be a legally constituted municipality within Tennessee.

Mr. Puscas comes to Oak Ridge with a successful background of training and experience. Prior to his present appointment he served successively with the Lorain County Health Department, Oberlin, the Geauga County Health Department, Chardon, as district sanitarian with the Northeast branch of the Ohio

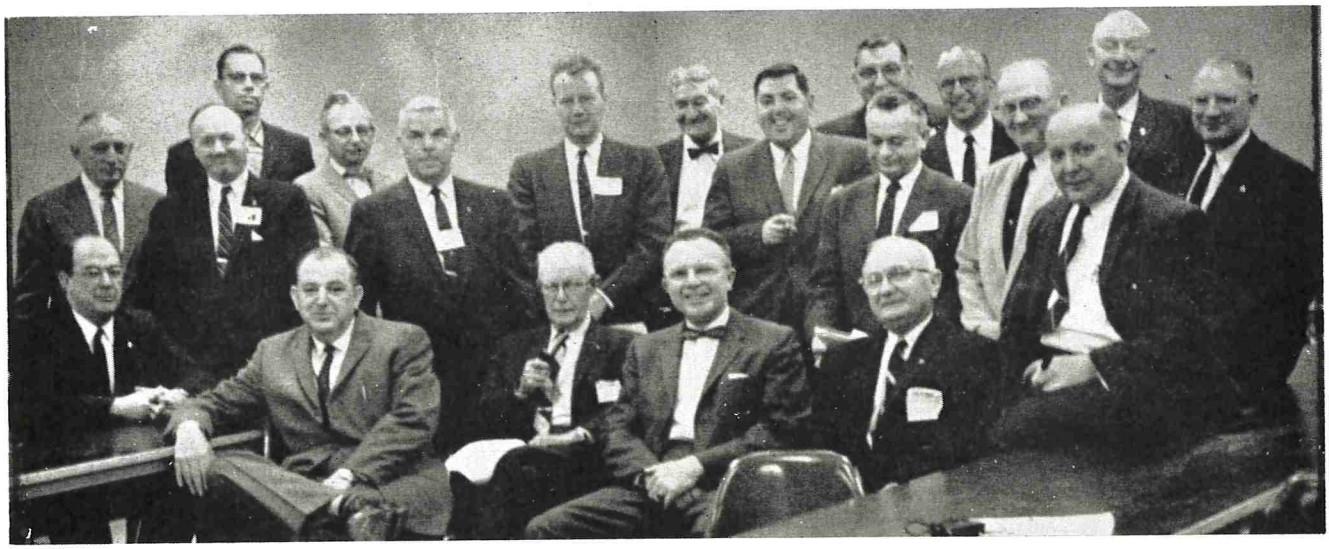
Department of Health, and as Health Officer for the City of Painesville, Ohio.

During his tenure at Painesville, which extended from 1957 to March 1960, he was able to effect an increase in the Health Department budget from nine thousand five hundred dollars to eighteen thousand five hundred dollars for 1960.

After four years in the Armed Forces, 1941-45, Mr. Puscas continued his education and graduated from Indiana University, Department of Public Health, with a B. S. degree in 1951. Immediately following he enrolled in the School of Public Health, University of North Carolina, and received his M. S. P. H., in 1952.

In Ohio, he was active in the Association of Public Health Sanitarians where he served as membership chairman, Secretary-Treasurer, and as Editor of the publication, the *Ohio Sanitarian*. He is a Fellow of the American Public Health Association and a member of International.

His many friends and associates wish him well in his new work.



Representatives of the U. S. Public Health Service, Milk and Food Programs and the Sanitary Procedures Committee of IAMFS at the recent meeting of the 3A Sanitary Standards Committees in the Georgia Center for Continuing Education, U. of Georgia, Athens.

First row seated: H. B. Robinson, John D. Faulkner, C. A. Abele, Leroy Hauser, Milton Fisher, W. A. McLean; First row standing: Paul Corash, Clarence Lucterhand, Ivan Parkin, William Jordan, Irwin Schlaufman, Luther Black, George Steele, K. G. Weckel; Back row: Dick Whitehead, R. M. Parry, Mark Howlett, Floyd Fenton, James Westbrook, H. L. Thomasson.

"Antibiotics and Pesticides in the Milk Supply" was the subject of this panel group at the Conference featuring (l to r) O. L. Hunnicutt, Ohio Dept. of Agr.; Dr. G. L. Ware, OSU, Dept. of Entomology; Dr. H. G. Geyer, State Veterinarian; Dr. H. E. Kennedy, OSU, Dept. of Dairy Technology; and A. J. Good, Pickerington, Chairman of the session.

ANNUAL DAIRY TECHNOLOGY CONFERENCE HELD AT OHIO STATE

More than four hundred fifty persons attended the 27th Annual Dairy Technology Conference held at Ohio State University in March. The Theme of the Conference was, "Advances in Science and Management." This theme was emphasized in five sections of the three day event involving, (1) Field; (2) Dairy Plant Management and Operation; (3) Engineering and Processing; (4) Quality Control of Cultured Products; (5) Ice Cream Operations.

Within the five separate sections a large number of timely topics were covered, some of which are as follows: The Pesticide Situation; Antibiotics in Milk; Sensible Quality Standards; Some Challenges the Fieldman Faces; Pinpointing Dairy Plant Costs; Advances in Heat Processing; Advances in Quality Control and Means to Better Cultured Products.

The sessions were so planned that all persons involved in the dairy products field would find a subject of immediate interest. Excellent advance planning and the services of experts in their respective fields made this an outstanding meeting, another one of a long series of successful conferences of this type held by Ohio State University and its Department of Dairy Technology.

1960 AMERICAN DAIRY SCIENCE ASSOCIATION TO MEET AT LOGAN, UTAH

The 55th Annual American Dairy Science Association conference, slated for June 19-22, 1960 at Logan, Utah, will feature the largest number of research papers ever presented at the Associations' annual meetings. According to Dr. George E. Stoddard of Utah State University Dairy Husbandry Department, over 200 papers will be presented from research studies in 42 states, District of Columbia, Canada, England, and Columbia.

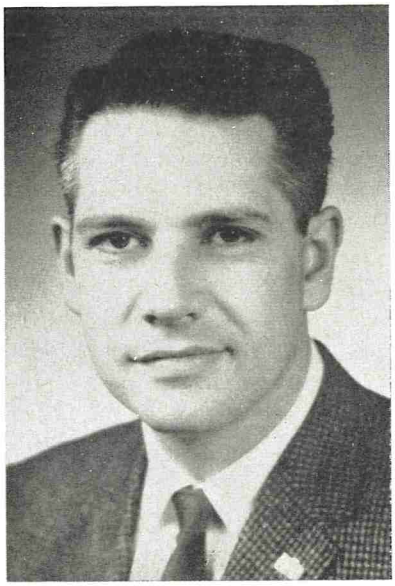
Professor A. J. Morris, head of Utah State University Dairy Science Department is chairman of conference arrangements. Mrs. Lyman Rich, Mrs. David Burgoyne and Mrs. Morris are in charge of program arrangements for the women and children.

A special symposium of interest to men and women will deal with "Facts, Fallacies and Conflicts Affecting the Demand for Dairy Foods." This will be moderated by W. D. Knox, editor, Hoards Dairyman Magazine.

According to Professor Morris, the dairy scientists attending the meeting at Logan will obtain the benefit of the largest number of research papers on research conducted in the United States and other countries that has ever been presented at the associations annual meetings.

Another economically important symposium will deal with milk solids-not-fat. Present trends indicate that more emphasis is being placed on the solids in milk other than fat as well as on the fat itself. How this might influence the future value and methods of payment for milk will be discussed along with methods of determining milk solids-not-fat, Dr. Stoddard said.

PAUL A. FREEBAIRN RESIGNS FROM SALT LAKE CITY HEALTH DEPARTMENT—TAKES INDUSTRY POSITION



Paul A. Freebairn

Paul A. Freebairn has joined the B-K Department sales staff of Pennsalt Chemicals Corporation. He will represent the company's dairy, food and water sanitation products in all of the state of Michigan except the upper peninsula.

Freebairn, a native of Salt Lake City, Utah, attended Brigham Young and Utah State Universities and has had extensive training in bacteriology, dairy and dairy chemistry. Before joining Pennsalt he was Officer Manager of the Pacific Fruit and Produce Company and Chief of The Milk Division of the Salt Lake City Health Department.

Holding Utah State registration to practice sanitation, Freebairn has written and published numerous articles on various phases of health and sanitation in the dairy field. Some of these include "Recirculation Cleaning" in the *Dairy Plant Fieldman;* "Acidic Rinse for Equipment" and "Leptospirosis and Q Fever" in the *Federated Products Association;* and "Is Your Bulk Tank Clean?" in the *Utah Poultry Magazine,* among others.

During his eleven years in sanitation in Utah, Freebairn was active in many organizations. He was President of the Rocky Mountain Association of Milk & Food Sanitarians, Vice President of the Utah Dairy Technology Society, and he was on the executive board of the Utah Association of Sanitarians. A member of the International Association of Milk & Food Sanitarians and the National Association of Sanitarians, he served on the membership committee of the Utah Public Health Association.

Freebairn, his wife Dorothy, and two sons, will live in the Detroit area.

His many friends in the Rocky Mountain Association and in International wish him well in his new work.

FAULKNER ANNOUNCES ORGANIZATIONAL AND OTHER CHANGES IN PUBLIC HEALTH SERVICE MILK AND FOOD PROGRAM

John D. Faulkner, Chief, Milk and Food Program, Public Health Service recently announced changes in the organizational structure of the Milk and Food Program and certain personnel assignments and reassignments. Mr. Faulkners communication included the following information:

Effective March 7, 1960, a Special Projects Section was established in the Milk and Food Program. The principal functions of this new Section are: (a) evaluation of new developments in milk and food technology with respect to the impact on current public health practice, and need for further study, research, or program reorientation; (b) planning and conduct of Milk and Food Program activities concerned with radioactive contamination of milk; and (c) planning and conduct of special studies of existing sanitary control procedures and administrative practices in milk, food, and shellfish sanitation in relation to the effectiveness of such procedures and practices, adequacy in light of changing technology, and efficient use of resources.

Mr. Harold B. Robinson has been relieved from his assignment as Chief, Milk Sanitation Section, Milk and Food Program, Washington, D. C., and assigned to the new position of Chief, Special Projects Section, Milk and Food Program, Washington, D. C.

Mr. Leroy S. Houser has been relieved from his assignment as Regional Milk and Food Consultant, Public Health Service Regional Office, San Francisco, California, and assigned to the position of Chief, Milk Sanitation Section, Milk and Food Program, Washington, D. C., vice Mr. Robinson.

Mr. Donald Summers has been relieved from his position as Staff Officer, Food Sanitation Section, Milk and Food Program, Washington, D. C., and

assigned to the position of Acting Regional Milk and Food Consultant, Public Health Service Regional Office, San Francisco, California.

Mr. John H. McCutchen was recently called to active duty by the Public Health Service and has been assigned to the Milk Sanitation Section, Milk and Food Program, Washington, D. C. Mr. McCutchen was formerly with the Missouri Department of Health.

The following Public Health Service Reserve Officers have been called to active duty and assigned to milk and food sanitation activities in the regional offices indicated after their names: Thomas F. Lofthouse, Kansas City Regional Office; Harry A. Haverland, Dallas Regional Office; Robert A. Stevens, Charlottesville Regional Office; Dr. Carl O. Olsen, Atlanta Regional Office; Robert W. Wilson, New York Regional Office; and Robert W. Ondrusek, Chicago Regional Office.

Max W. Decker, DVM, has been called to duty by the Public Health Service and assigned to the position of Veterinary Consultant, Milk and Food Program, Washington, D. C. Dr. Decker was formerly with the Michigan State Department of Health.

HEARINGS SCHEDULED ON NATIONAL MILK SANITATION BILL

Hearings on Wisconsin Cong. Lester Johnson's National Milk Sanitation bill have been scheduled for April 26-28 before the House Interstate and Foreign Commerce Committee's Health and Science Subcommittee. During the three-day hearings, public health officials, dairy leaders and representatives of consumer groups will be testifying on the legislation to allow the free movement of high-quality milk from state to state.

Under the provisions of the bill, the U. S. Public Health Service's Milk Code would be the quality yardstick for milk shipped in interstate commerce. Fluid milk and fluid milk products meeting the standards of this Code could not be kept out of interstate commerce because of varying local health rules.

"Sanitary regulations should be used only to protect the public health, not for the protection of local monopolies," commented Cong. Johnson. "Unfortunately, many cities are now using their arbitrary and outdated milk rules as trade barriers against high-quality milk from other areas. Obviously, this is a perversion of the intent of the regulations."

He pointed out that such "balkanization" of milk markets results in higher milk prices for consumers. In some places, such as the nation's capital, the health regulations prevent the entry of milk from other areas, giving an absolute monoply to local producers. Other cities permit milk to be shipped in only after it has been checked by their own inspectors at its point of origin to see that it meets the standards of the receiving area. He added that since the milk must also conform to the sanitary rules of the shipping area, the resulting duplicate inspections add to the cost of the milk.

Cong. Johnson's bill is designed to avoid adding another layer of expensive inspections to the existing system. Under the provisions of his measure, dairy plant inspections would continue to be carried on by state and local health officials. The results of their inspections would be certified by the U. S. Public Health Service. Milk from certified plants could move freely from state to state.

"Fortunately, we do not have to start from scratch to formulate a good, sound set of uniform sanitation standards for quality milk. We already have a proven set of health regulations in the U. S. Milk Code," Cong. Johnson noted. "Designed as a model for the industry, the Code is the work of top technical experts in both the health and dairy fields. Since the first Code was published in 1924, it has been revised 12 times to keep pace with the rapid improvements in milk processing, handling and shipment. The Code has already been voluntarily adopted as the basis for milk sanitation regulations by 36 states and 2,000 cities and municipalities."

The April hearings mark the second time that members of the Interstate and Foreign Commerce Committee have studied the subject of national milk sanitation legislation. In 1958, they conducted hearings on a bill by Cong. Johnson which provided that all milk shipped in interstate trade must conform to the Federal Milk Code.

"Testimony at those hearings proved very useful to me by pointing out some weak spots in the legislation," remarked Cong. Johnson. "In drafting the present measure, I have worked with public health officials to iron out those difficulties."

Objections had been raised to the tendency of the earlier bill to force all milk up to the standards of the U. S. Milk Code. Many sanitarians were also of the opinion that the old bill took away their rights to control the quality of milk shipped within their state or locality.

The current bill does not require any state or municipality to adopt the U. S. Milk Code, nor must all milk shipped in interstate commerce conform to the Code. However, milk which does meet the high standards of the Code cannot be excluded from any interstate market on health grounds.

Cong. Johnson's revised bill contains many safeguards for areas receiving milk shipped from certified plants. Local health authorities would retain the

right to inspect the milk upon arrival to make sure it had not deteriorated or been mishandled in transit. From there on, the handling, processing and sale of the interstate milk would have to meet the requirements applied to milk entering the market from sources inside the state.

"I feel that this National Milk Sanitation legislation will go far toward correcting the present unfair situation which works to such disadvantage for both consumers and the bulk of milk producers," Cong. Johnson stated. "My home state of Wisconsin ranks number one in the nation in milk production. Yet our Class I milk, which meets the highest quality standards, is currently being kept out of many markets because of a complicated maze of contradictory sanitary regulations. Cut off from outside markets, the Wisconsin farmer sees his Class 1 milk relegated to lower price uses and labeled surplus."

He pointed out that interest in federal legislation in the field of quality standards for milk has been steadily increasing. All of the Wisconsin Congressmen and ten from other states have joined Cong. Johnson in introducing the National Milk Sanitation bill. On the Senate side, it is being sponsored by Sen. Hubert Humphrey (Minn.) and co-sponsored by his Minnesota colleague, Sen. Eugene McCarthy, and Wisconsin Senators William Proxmire and Alexander Wiley.

In January, the General Federation of Women's Clubs recommended that the measure be studied by the Federation's 15,000 member clubs across the country. Other consumer groups, such as the Connecticut Milk Consumers Association, are supporting the effort to permit the sale anywhere in the country of milk which meets accepted, proven health standards.

After a thorough investigation of the problem, the Association of State and Territorial Health Officers noted that commendable voluntary efforts to estabilsh a uniform sanitation standard for milk have not been able to break down deliberate barriers which hinder the shipment of milk from state to state. Members of that Association issued a set of recommendations for federal action to improve this situation. These recommendations have been incorporated into Cong. Johnson's National Milk Sanitation bill.

In addition, the National Association of Commissioners, Secretaries and Directors of Agriculture have recognized the wisdom of setting up a uniform national health law for milk. The President's National Agricultural Advisory Commission has recommended a study of federal quality standards for milk.

Other organizations which have indicated their support of National Milk Sanitation legislation include the National Creameries Association, National Association of Dairy Equipment Manufacturers, Wisconsin Farm Bureau, Wisconsin Farmers Union, Wisconsin Grange, Wisconsin Council of Agriculture Cooperative, Wisconsin Association of Cooperatives, Wisconsin Agriculturist and Farmers, Hoard's Dairyman, Minnesota Farm Bureau, Minnesota Farmers Union, Minnesota Creamery Operators and Dairymen's Association, and Land O'Lakes Creameries.

UNIVERSITY OF NORTH CAROLINA OFFERS SECOND ANNUAL SHORT COURSE IN SANITATION

The School of Public Health, University of North Carolina anounces the second annual short course in, "Principles and Practices of Sanitation" which will consider the application of the basic sciences to the control of the environment. The course will cover the period June 13 to July 8 and is open to both North Carolina residents and those from outside the State. The resident fee for the course is forty-one dollars and for non-residents tuition is sixty one dollars.

Instruction will be given in the biological, chemical and physical sciences and their application to the design, operation and control of small water supplies, sewage disposal installations, recreational facilities, insect and rodent control, refuse handling community air hygiene and ionizing radiation hazards.

The course is open to sanitarians from health agencies, industries and other organizations who are unable to undertake full time academic work. The class will be limited to about 20 enrollees. Faculty members of the School of Public Health and selected visiting instructors will present the course work in the classroom and laboratory.

For further information all inquiries should be addressed to: Professor Gilbert L. Kelso, The School of Public Health, University of North Carolina, Chapel Hill, N. C.

RESEARCH FACILITIES EXPANDED AT OHIO STATE UNIVERSITY

A new $180,000 Water Resources Center, scheduled for completion in May, 1960, will about triple space available on the campus for chemical and biological research in water, sewage, and industrial wastes.

The new facility, now under construction, has been made possible from a grant by the National Institutes of Health and State of Ohio appropriation. Also included in the plans is remodeling of existing laboratory space.

In addition to providing space for university research the new facility together with the existing multiple process pilot treatment plant will greatly enhance the opportunities available to industrial and governmental organizations for contractual research.

TABULATION OF RESEARCH AND STUDY NEEDS IN FOOD PROTECTION

A report entitled "Food Sanitation Research and Needs" has just been released by the Engineering and Sanitation Section of the American Public Health Association. The report prepared by the Comittee on Food Protection, of the Section, establishes for the first time, a guide to research and study needs in the field of food protection. Based on a national survey of the nation's leading public health officials, the report establishes over one hundred basic and applied study and research projects which are currently needed for the continued improvement and development of the nation's food protection programs.

Each research and study project is recorded on an individual data sheet and source of references and cross-references are enumerated thereon. This information should be of extreme value to the researcher who is engaged in, or planning a project in a given area. Project areas relating to radiation, bacteriology, chemistry, engineering, and most of the allied science fields, are included. A means of classification has been established to facilitate proper referencing of the various projects. These classification areas include: Administration (codes and/or standards); Epidemiology, Engineering; Food Technology; Bacteriology and Chemistry. Likewise, a system of priorities has been established to direct attention to the more essential problems. The Committee, recognizing that many researchers are con-

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POSITION AVAILABLE

HIGHER SALARIES—are being offered to qualified Sanitarians by Public Health Services for the Philadelphia Department of Public Health. The work will involve checking the usual problems associated with the milk and food establishments including inspection of high temperature short time units, swimming pool sanitation cross connection control, lighting evaluation and school sanitation. New employees will start at $5348-liberal fringe benefits. For information call Mr. Speck at LO 7-0290 or write Room 504, City Hall Annex, Philadelphia 7, Pennsylvania.

cerned with only specific aspects or phases of the food industry, provided further identification and cross-indexing of the projects. Cross-indexing includes the following phases:

Production	Retail Sale
Transportation (producer to processor)	Preparation
Processing	Laboratory
Transportation (processor to consumer)	

Based on these classifications and codifications, a master tabulation has been prepared in such a manner, that through the use of master files, an individual may, following selection of a project from any one of the breakdowns, obtain the complete reference data sheet for the specific project. Thus obtaining all information reported regarding the selected project.

For copies of this report or additional details, contact Tom S. Gable, Chairman, Committee on Food Protection, American Public Health Association, School of Public Health, University of Michigan, Ann Arbor, Michigan.

Index To Advertisers

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Food and Drug Administration

The Food and Drug Administration on April 14, issued a stay of its March 1, 1960 order establishing definitions and standards of identity for orange juice and orange juice products.

The order as published in the Federal Register gave notice of a provision of law allowing thirty days for the filing of objections by parties adversely affected. John L. Harvey, Deputy Commissioner of Food and Drugs, said a large number of objections were received, several of which presented reasonable grounds in support of requests for a public hearing. Under the circumstances, a public hearing is mandatory and the standards will not become effective on June 1, 1960, as originally contemplated, Mr. Harvey said.

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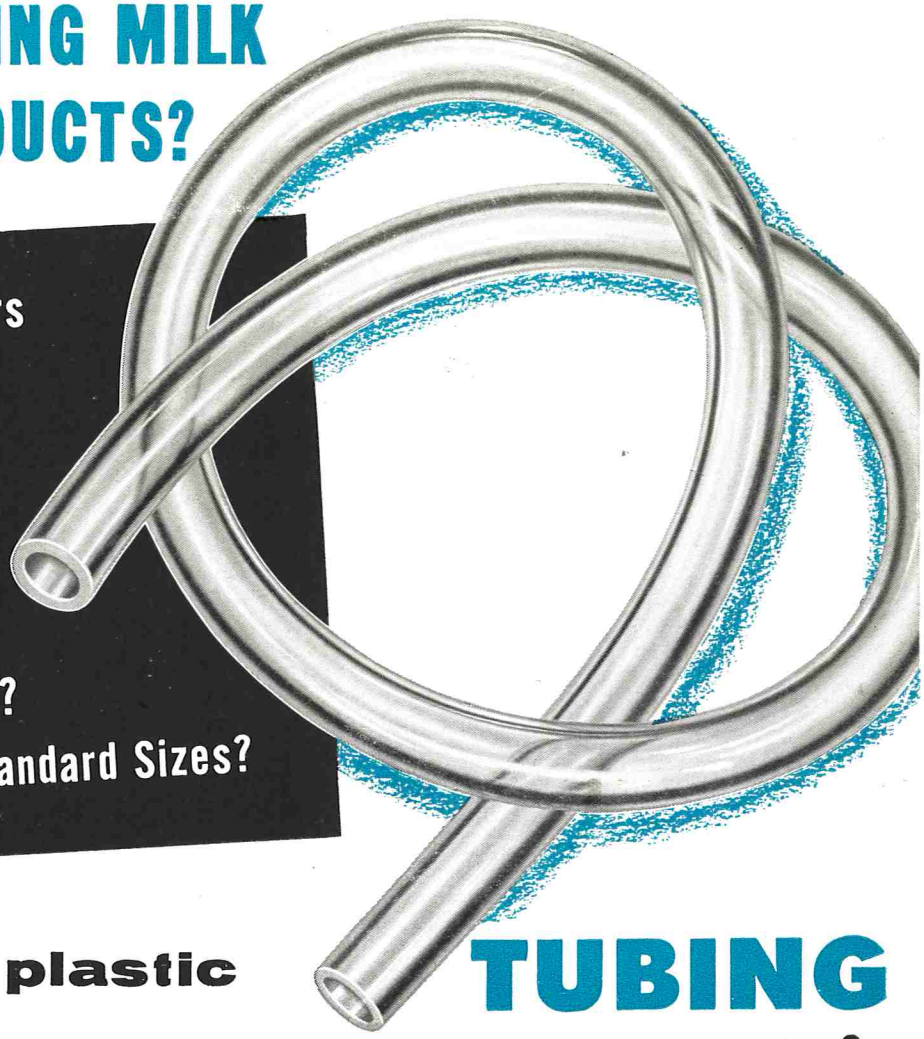

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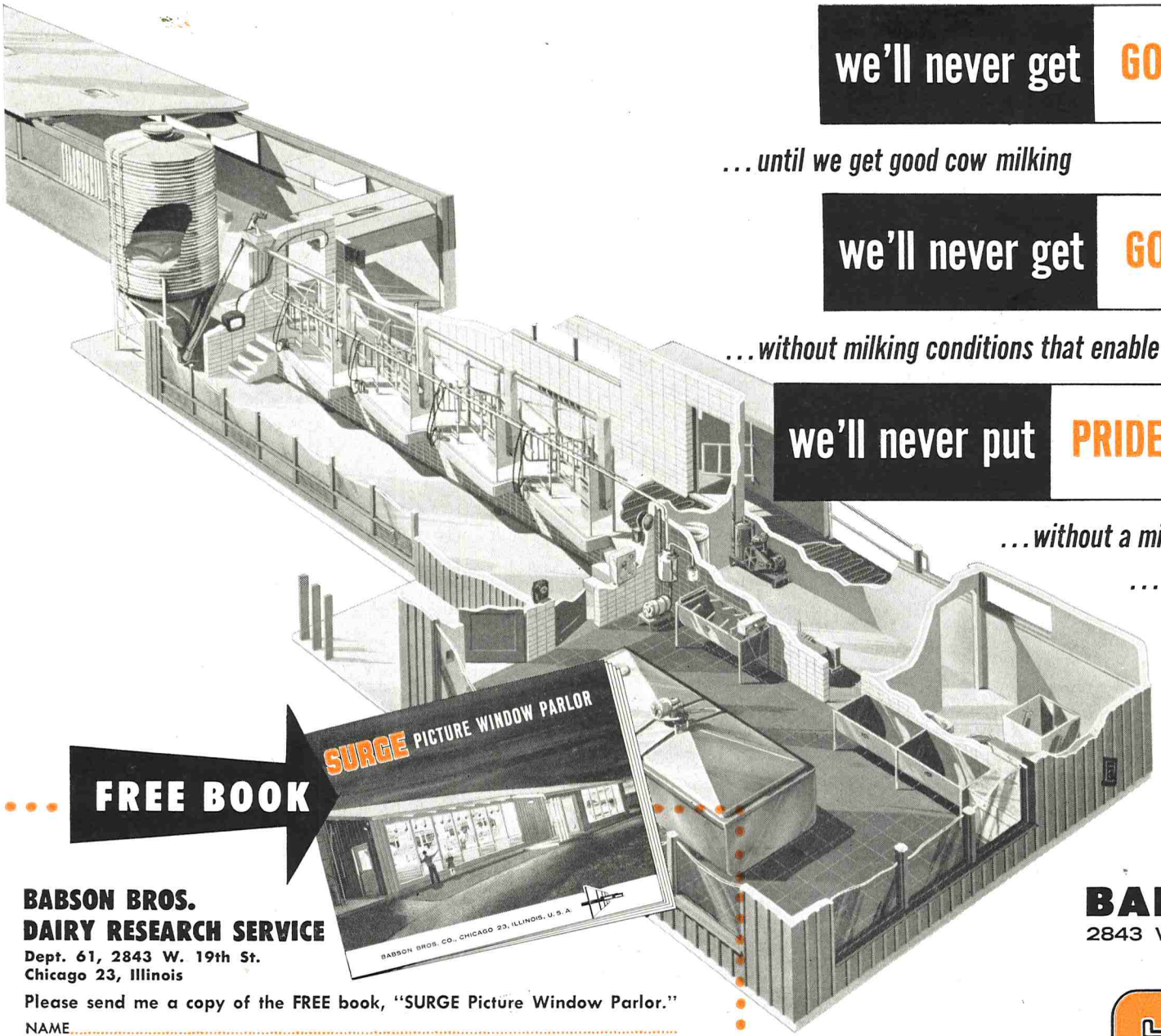

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