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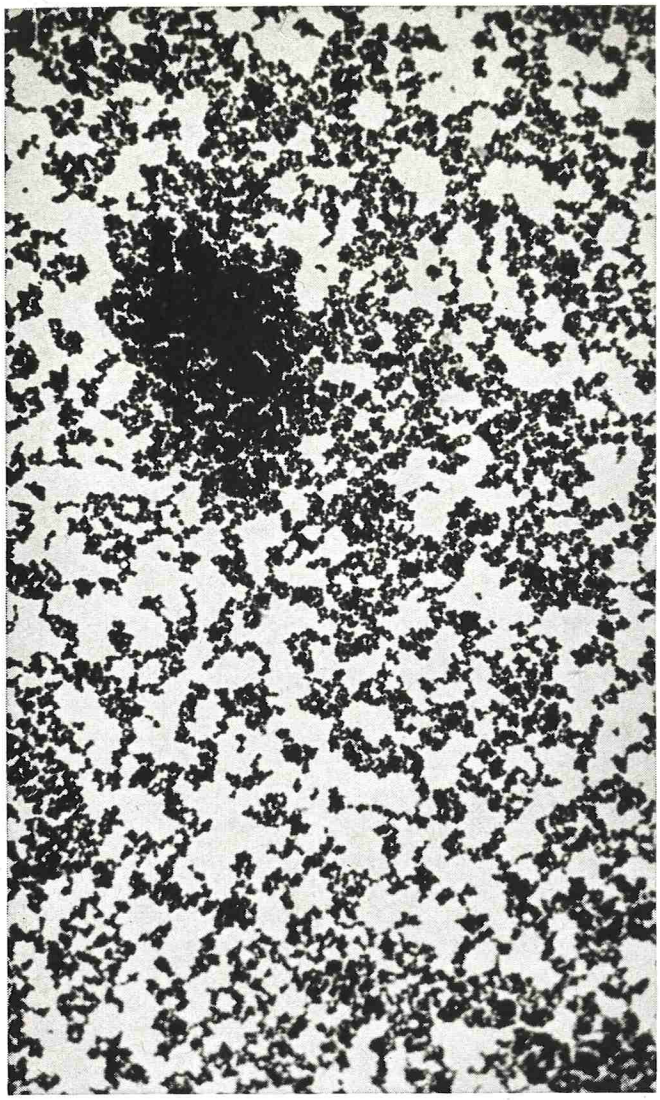

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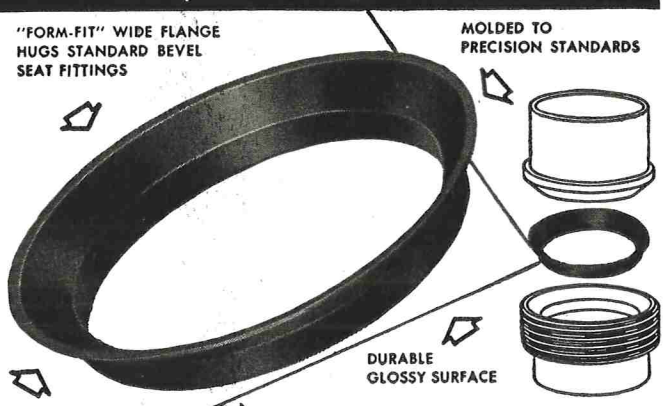

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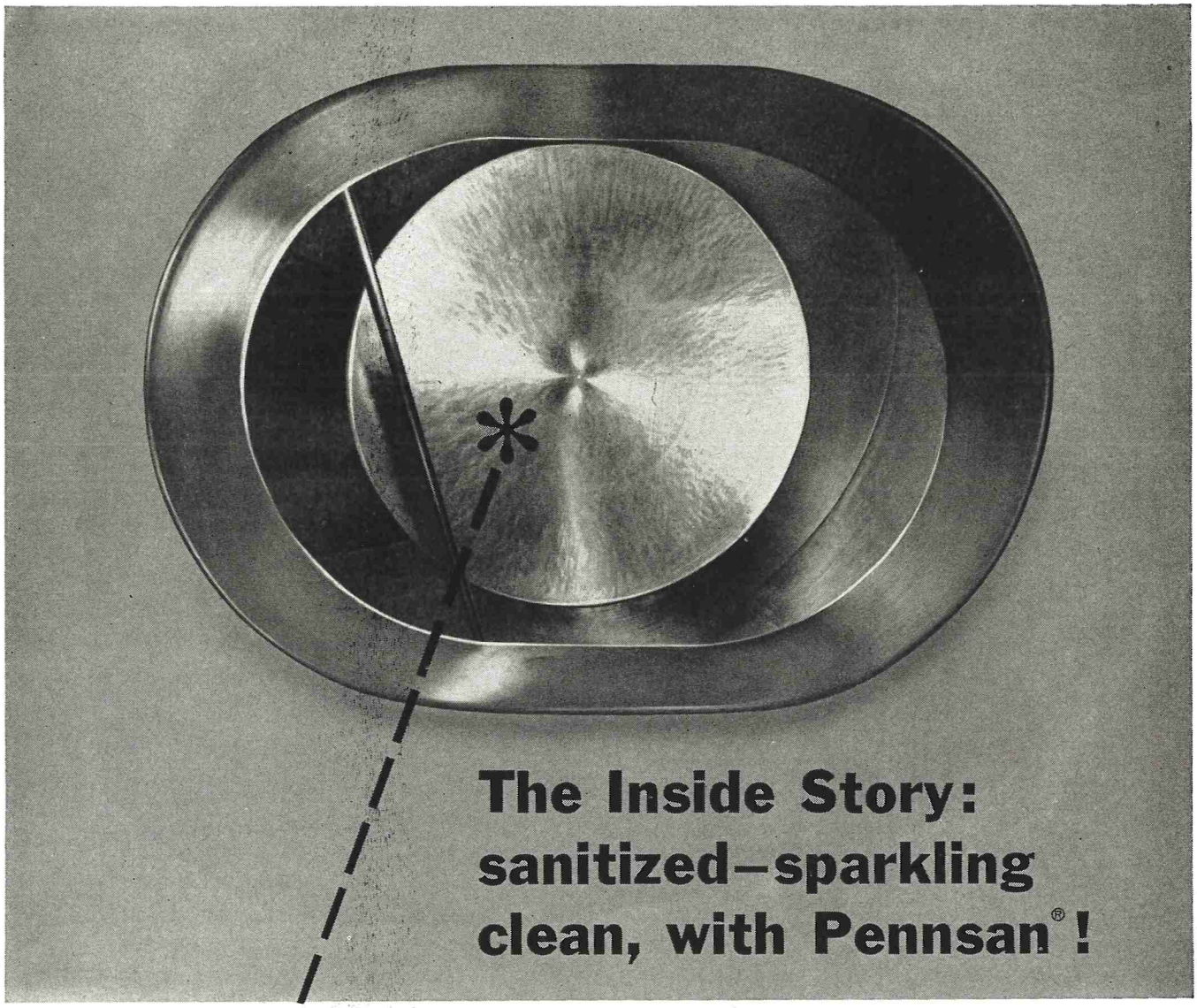

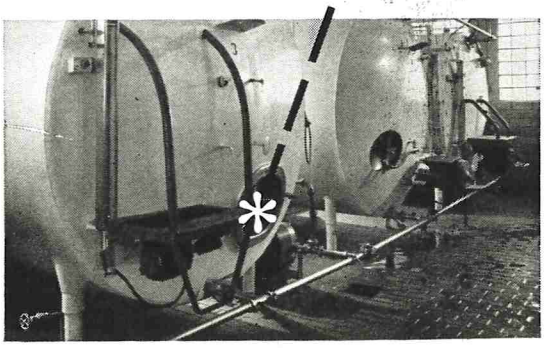

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EDITORIAL

IAMFS – A DIVIDEND

In any of the thirty Affiliates of the International Association of Milk and Food Sanitarians, in addition to the many official agency people, will be found all types of employees of the food industry; laymen and professional, industry management, individual workers, manufacturers and salesmen, professors and students, laboratory directors, and research personnel. All are molded together, with a common denominator, *what is good for the public is good for me.*

Because of a close connection with the Connecticut Association of Dairy and Food Sanitarians, a few of its activities which have constructive value in coordinating and molding sanitarians should be pointed out. Four committees, through their deliberations, promulgate and recommend to Connecticut future standards, rules, regulations and laws. The State Association also assists deserving students by giving college scholarships and introduces high school students to the advantages of a career in the field of milk and food sanitation. Needless to say, such projects are of inestimable value in diseminating knowledge about the Association and its fields of interest.

This serves to illustrate what one affiliate does to futher the cause, but let it not be forgotten that there is a total of thirty affiliates. These are welded together by *International,* giving each member a sense of belonging and a feeling of national unity. It doesn't take unusual perception to realize that many members carry on many similar duties every day in all parts of this country and in Canada.

Still another service rendered through *International* is its committee work. Members of each committee of the IAMFS are from all regions of the United States and Canada. This gives to each committee broader understanding of the subject under study. Committee reports are generally considered by all sanitarians to be valuable, and are used as guides and standards for control of milk and food production, processing and transportation.

Once each year IAMFS holds a meeting for business purposes and to conduct a technical and an educational program. This is not a closed meeting. Time permitting, questions from the floor are discussed. Also, at this annual meeting officers are elected by majority vote of members present. These constitute the Executive Board which administers the affairs of the Association, aided by a full time executive secretary.

Annual meetings of the IAMFS are held in different geographic location each year, thus giving all members the opportunity to attend at least a meeting every 4-5 years without too great a cost to him.

Too, there is more opportunity for each member and affiliate to be represented in the operations and administration of the business of the IAMFS – namely the Council of Affiliates. Each affiliate has one representative on this Council regardless of size; it is suggested that the Secretary of the Affiliate be this representative. In this case the affiliate has a responsibility to see that its representative is present at the annual meeting of the Council of Affiliates. In the past, the Execueive Board has been invited to attend the meetings of the council, thereby the knowledge and experience of both groups is shared. The agenda of the Council is made up by the affiliate secretaries. Each item on the agenda is given full consideration at the meeting of the Council.

The Council of Affiliates can be an effective organ of the IAMFS if members so desire. First, all thirty affiliates should be represented either by the secretary or some other properly designated person. Secondly, this representative should be prepared to discuss all items on the agenda with a constructive purpose. Thirdly, the Executive Board should carry out all suggestions promptly and in an orderly manner, or report back at the next subsequent meeting the impracticalities of the suggestion.

The cost of membership of the IAMFS is nominal, and it is also voluntary. The reward for membership is valued by what one puts into it. Active membership will return a sizeable dividend, while inactive membership a disappointment.

Experience has shown, time and again, that good sound ideas come from the grass roots – thus in our IAMFS chain of committees, local affiliates, national committees, and the parent organization, we have a fertile field for ideas to grow and be cultivated and finally put to work by various regulatory agencies.

The IAMFS is an active, virile association of sanitarians who are interested in *what is good for the public is good for me.*

R. M. Parry, V.M.D.
Chief, Dairy Division, Connecticut Dept of
Agriculture and Natural Resources
Hartford, 15, Connecticut

BACTERIAL COUNTS OF BULK MILK FOR INTERSTATE SHIPMENT

I. EFFECT OF SAMPLING PROCEDURES

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U. S. Department of Health, Education, and Welfare,
Cincinnati, Ohio

(Received for publication March 14, 1962)

The wide acceptance in recent years of pipeline milking and mechanical refrigeration of milk in farm bulk tanks has raised questions concerning concepts previously developed for milk in cans on the relation between bacterial counts and farm and plant production practices. Earlier studies dealt with cooling of milk cans in a stock watering tank or in a spring, the use of insulated ice water tanks, and the use of electrically operated coolers. However, the prompt cooling of milk to temperatures below 40°F, in farm bulk tanks, is generally lower than previously possible using can cooling tanks.

Accordingly, this investigation of bulk milk transfer was initiated to determine the influence of present-day production practices, on the dairy farm and in the bulk milk receiving stations or processing plants, upon the bacterial counts of milk subjected to long distance interstate shipments prior to pasteurization. Results of studies of this nature should be helpful in re-evaluations of current bacterial standards and other criteria necessary to determine the sanitary quality of milk. The investigation also included a reappraisal of the adequacy of present sampling practices as applied to farm bulk tanks, pick-up and transport trucks, and plant storage tanks, and the adequacy of mixing samples in tanks.

Although major emphasis was placed on studying milk shipping areas employing bulk tank installations, milk cooled in cans was also studied. Bartlett *(2)* has reported that milk in cans had an average plate count of 180,000 bacteria per ml, whereas milk from bulk tanks averaged less than 30,000 bacteria per ml. Since Bartlett's study was limited to one sampling area, it was anticipated that an investigation covering several sampling areas would provide more useful information.

Marth, Hunter, and Frazier *(3)* have reported that significant increases did not occur in the bacterial plate counts of milk during transportation from the dairy farm to the receiving station. The results of their study were based upon raw milk sampled from two farm bulk milk tanks of different construction at one dairy farm.

In order best to interpret the influence of farm and plant handling practices upon bulk milk transfer, arrangements were made to sample bulk milk or can milk at various geographical locations in the United States at different seasons of the year. Sampling areas were located in the Northeast, North Central, South Central, Central, and Western regions of the United States. Although an attempt was made to study the seasonal variations which might occur, it should be realized that only two or three seasons were represented for certain sampling areas.

Procedures

Bulk milk shipping stations visited included Bridport, Vermont; Champlain, New York; Bristol, Virginia; Magnolia, Mississippi; Monett, Missouri; Erie, Kansas; Marion, Iowa; Barron, Wisconsin; and Smithfield, Utah. Samples were collected from farm bulk tanks, transport and pick-up trucks and shipping station weigh and holding tanks, pipelines and coolers. Pasteurization plants in Boston, Massachusetts; Jamaica, New York; Pensacola, Florida; Port Arthur, Texas; Dallas, Texas; Chicago, Illinois; and Denver, Colorado, were utilized to study the influence of transportation in over-the-road tankers upon the bacterial counts of raw milk after leaving the shipping station. Throughout the investigation, the equipment and procedures used for collecting samples conformed with those indicated in *Standard Methods for the Examination of Dairy Products,* eleventh edition (1).

The bacteriological tests made on the various samples collected included standard plate counts, oval tube counts, coliform and psychrophilic counts, and inhibition tests for the presence of antibiotics. The Gerber butterfat test was used to indicate the presence or absence of homogeneity in the samples collected. All laboratory procedures used conformed with those indicated in *Standard Methods for the Examination of Dairy Products,* eleventh edition *(1).* In addition to the laboratory tests conducted when the various samples were collected, ambient, milk, and farm bulk tank thermometer temperatures were recorded as well as the time and date of sampling. The bacteriological and chemical examinations of samples were conducted primarily in official or officially designated laboratories.

At the various shipping and pasteurization plants, equipment data were collected on the type, size and

make of pick-up, storage, and transport tanks, whether equipped with built-in or portable agitators, frequency and periods of operation. The type, size, and make of pumps, speed, periods of use, and inactivity were likewise recorded. The frequency of dismantling, cleaning procedures, and sanitization practices, nature, concentration and volumes of bactericides, if used, were also recorded for all tanks, vats, pipelines, pumps, agitators or other equipment coming into contact with the milk examined.

The sampling procedure which was followed in each shipping station and pasteurization plant consisted of the collection of two or three samples from each handling phase and the resultant bacteriological and butterfat analyses made on each sample. Although high butterfat percentages will not always be accompanied by high bacterial counts, samples of poorly agitated milk do show widespread differences in butterfat percentages, and these variations are related to the bacteriological data obtained. Accordingly, additional samples were collected at those sampling places where storage of milk might present a problem of questionable homogeneity. The sampling places and number of samples collected followed this order: Farm bulk tank, after at least three minutes' agitation, 3; farm bulk tank, during emptying, 3; farm pick-up trucks at farm during filling, 3; farm pick-up truck at shipping station, before emptying, 1; farm pick-up truck, during emptying, 3; plant storage tank, during filling, 3; plant storage tank, after storage, after agitation, 1; plant storage tank, during emptying, 3; transport truck, during filling, 3; transport truck, before departure, 2; transport truck at pasteurization plant, before agitation, 1; transport truck, after agitation, 2-3; transport truck, during emptying, 3; plant storage tank, during filling, 3; and plant storage tank, after filling, after 20 minutes' agitation, 1. When tank trucks or plant holding tanks are sampled, it may be very difficult, using existing sampling procedures, to procure samples from various locations in these tanks. In order to collect samples in dairy pipelines at various time intervals, the standard ells were replaced by stainless steel sampling ells containing 1/4-in diameter machine thread couplings 3/8-in long, welded in at a 90°-angle to the outside curvature of the ell, equipped with stainless steel petcocks. Figure 1 illustrates a typical sampling ell. Using these sampling ells, samples of milk were collected which corresponded to the different depths of milk present in a holding tank or tank truck.

Although it was not possible at all shipping locations to collect samples from each dairy farm producing milk used in interstate shipment, a representative number of farms were sampled in the major milk-producing areas of the United States. Extensive examinations were made of dairy farm milk production practices and their relationship to a high quality milk supply as measured by physical, chemical, and bacteriological tests. At all shipping locations, farm pick-up trucks were sampled upon arrival at the transfer station. At certain locations, the farm pick-up truck transferred its milk directly to the transport tanker instead of transferral to a shipping station holding tank. In some instances, milk was circulated through a cooler positioned outside the dairy plant before entering the transport tanker. In the most elaborate system, milk was pumped from farm pick-up trucks into a shipping station, through a "sweet water" cooler into a storage tank. Following storage, milk was passed again through the "sweet water" cooler and loaded into the transport tanker. At another shipping location milk in cans as well as milk from pick-up trucks was received, both of which were sampled.

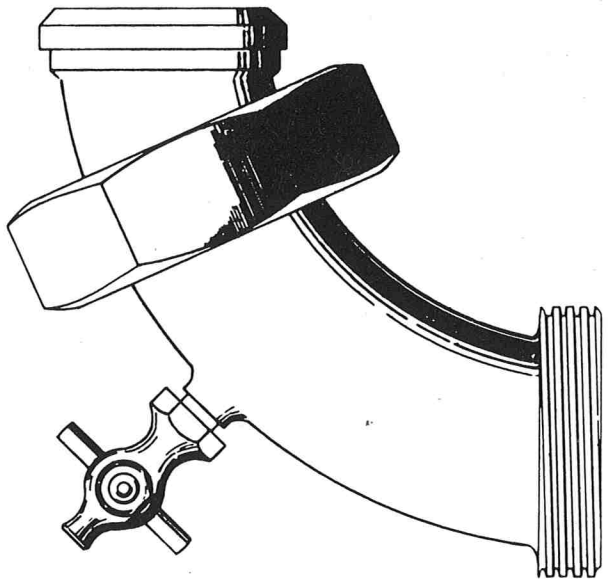

Figure 1. Sampling ell.

RESULTS AND DISCUSSION OF SAMPLING PROCEDURES

One variable that can seriously impair the accuracy or dependability of bacterial count results is the adequacy or amount of agitation required to produce homogeneity in stored milk in the farm bulk tank, pick-up or milk transport truck or in the dairy plant storage tank. The various types of agitation devices present in bulk tanks, plant storage tanks and pick-up and transport tankers if operated correctly and for a sufficient amount of time should produce the homogeneity required to permit a representative sample to be taken. Generally it was observed that the amount of agitation present in the farm bulk tanks sampled was adequate based on the results received from the butterfat tests which

were performed on all samples collected. On the other hand, butterfat tests made on samples collected from pick-up trucks and transport tank trucks indicated that the procurement of representative samples from these sources may often be unattainable unless particular precautions are followed. Figure 2 illustrates the influence of variations in butterfat content of grouped samples upon the bacteriological counts received from these samples. Note that butterfat values for some groups of samples ranged from 1.7 to 6.0% or higher. Figure 3 illustrates the slight differences in bacterial counts in grouped samples where butterfat tests have indicated a good degree of homogeneity.

During this investigation 98 shipments of milk were examined, and in approximately 16 shipments the milk collected from shipping stations or pasteurization plants showed gross variations in the butterfat content of triplicate samples collected from different sampling points. In view of these variations in butterfat and corresponding bacteriological count differences, it was not acceptable to include data on these shipments in the final tabulation of interstate shipments. Although the data could not be used in this study, the findings resulted in additional studies by official agencies in those areas of the United States where the problem of insufficient agitation existed. Their initial explorations have verified the described findings, and procedures are being revised to improve agitation where deficient.

Where doubt may exist as to the homogeneity of milk samples collected from farm pick-up trucks and milk transport trucks, extra samples should be taken, preferably at different levels of the stored milk, and butterfat tests performed in addition to the bacteriological tests on each sample. During this study, possession of data relative to homogeneity of samples collected from farm bulk tanks, pick-up and transport trucks, and storage tanks was extremely helpful in analyzing the effect of plant practices upon bacterial counts of raw milk for interstate shipment.

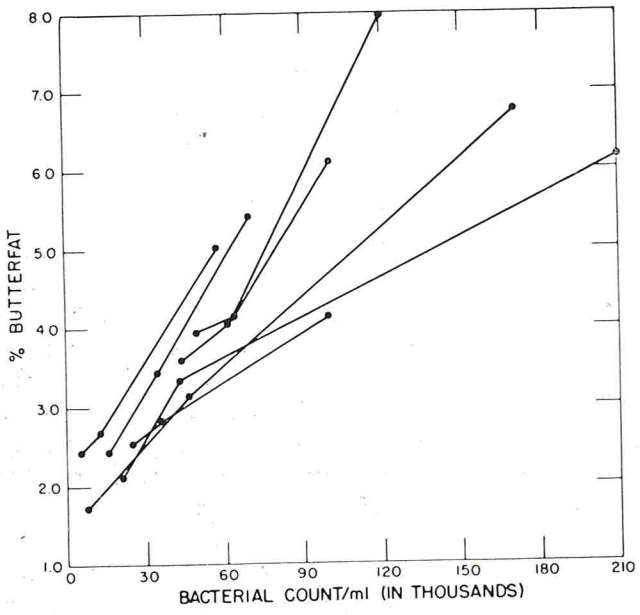

Figure 2. Variations in bacterial counts of replicate samples from inadequately mixed milk in bulk tanks.

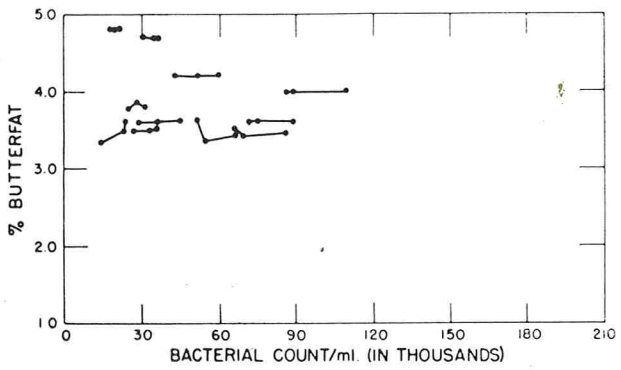

Figure 3. Variations in bacterial counts of replicate samples from well mixed milk in bulk tanks.

During the collection of samples, several factors relative to the agitation of milk in farm bulk tanks, plant storage tanks and transport tanks should always be considered. Immediately before taking samples from such storage tanks, the contents should be mixed until homogeneous. A non-homogeneous sample cannot be considered a representative sample. According to the 3-A Standards *(4)* the bulk tank agitator should be operated for at least five minutes to assure homogeneity. The time interval required for mixing large tanks will vary according to four conditions: *(a)* the shape and size of container; *(b)* the volume of milk or cream therein; *(c)* the type, location and force of the agitator; and *(d)* the creaming interval before starting agitation. Since these variables are important, it is necessary to determine the fat content of samples taken under the most unfavorable conditions of storage at each bulk tank installation to determine the minimal time of agitation required to assure homogeneity of contents.

Odor-free, pressurized filtered air or electrically driven stirring equipment were found to be in use for agitation of milk in storage and transport tanks.

The eleventh edition of *Standard Methods for the Examination of Dairy Products* recommends that in order to establish for each installation how long milk should be agitated to assure homogeneity, objective tests should be made, with the results recorded and placed on file at each installation. The fat content should be determined on subportions taken at different levels in the container and also

at nearby and extreme distances from the source of agitation or if this is not possible, by testing subsamples taken from first and last gallon of milk drained or pumped from container and from not less than four additional subsamples taken when about 20, 40, 60 and 80% of contents have been removed. *Standard Methods* states that when satisfactorily mixed, fat determinations on subportions usually will vary not more than ±0.04% from the mean for milk, all tolerances for inherent variables in method included. When taking representative samples, the sample container should be approximately two-thirds to three-quarters full.

Where agitation equipment is not available, samples from transport tank trucks arriving at pasteurization plants should be collected immediately upon arrival of the truck. Such sampling is predicated on the assumption that the truck should have been in rapid transit for at least five hours prior to sampling. When tank trucks make scheduled or unscheduled "stopovers" for periods in excess of fifteen minutes prior to arrival at pasteurization plants, agitation of the tank truck contents should be provided using either portable agitators or recirculation.

SUMMARY

The collection of representative samples of stored milk is dependent upon the type and amount of agitation provided. Whenever samples must be collected from farm bulk tanks, from pick-up trucks, dairy plant storage tanks and milk transport trucks, approved procedures for judging the homogeneity of stored milk should be followed to insure that the samples are representative. When representative samples of milk are analyzed bacteriologically, trends or patterns may be identifiable in relation to specific groups of bulk milk shipments.

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OBSERVATIONS ON THE PIPELINE MILKER OPERATION AND ITS EFFECT ON RANCIDITY

JOHN H. S. CHEN AND CHARLES R. BATES

Early Dawn Dairy Company, Veradale, Washington

(Received for publication July 2, 1961)

Samples of milk produced by four types of pipeline milking systems and one bucket-type milker were obtained at weekly intervals during a two-year study of the development of rancidity in bulk tank milk. The type of unit, and especially the mechanical features and operating conditions, were dominant factors in the development of rancidity in bulk tank milk. Advanced stage of lactation of a majority of the cows in the fall of the year did not appreciably affect the development of rancidity in mixed herd milk. Late winter and early spring milk of cows on dry feed was more easily conditioned for the development of rancidity.

The increased use of pipeline milker systems by the dairy farmers has resulted in an increase incidence of rancid milk *(7, 8, 15, 17, 22, 28, 30, 33, 34, 36, 45)*. When more than fifty percent of the milk received by a dairy plant is produced by means of pipeline milking systems, the increased risk of the development of rancidity in milk becomes a primary concern of the commercial dairy plant.

Previous studies *(19, 20, 21, 25, 29, 30, 31, 32, 45)* have shown that factors causing induced rancidity in pipeline-produced milk are excessive agitation in the presence of air (foaming), the use of long pipelines, numerous risers, continuous operation of centrifugal pumps, low rate of milk flow, partial churning in the in-line filter and elsewhere, combination of pumps and vacuum releasing devices that promote foaming, and numerous fittings in the vacuum section of the milk line.

In addition to the above factors, there also are some herd factors *(25)* which cannot be overlooked. There appears to be more incidence of the development of rancidity in milk of late lactation than in milk produced during the earlier part of the lactation period *(10, 16, 23, 25, 37, 38, 41)*. Pasture feeding significantly reduces the occurrence of spontaneous lipolysis in milk *(3, 10, 24)*. Mastitic milk appears to be an important factor in the development of rancidity in milk *(11, 42)*.

Organoleptic testing gives no warning of the development of rancidity prior to the appearance of the flavor. However, an increase in the acid degree value is associated with the appearance of detectable rancid flavor and this determination may be used in detecting the onset and cause of rancid development *(25)*. A simplified method *(1, 43)* used in this study appears to be quite satisfactory for this purpose.

This study was made at the Early Dawn Dairy Company, Veradale, Washington, in cooperation with the Spokane City Health Department, to determine causes and practical measures of preventing the development of rancidity in herd milk produced by pipeline milker systems.

METHODS

Four types of pipeline systems used in 23 installations which produced 54% of the milk received by Early Dawn Dairy, and three bucket-type milker units were studied in the Spokane area during 1959 and 1960. During 1959, 1,364 samples were obtained at weekly intervals for analysis.

The samples were obtained from bulk tanks from which the milk was picked up every other day. The temperature of the samples on arrival at the laboratory was from 36° to 40°F. Determination of the acid degree value (ml of 0.01N KOH to neutralize one gram fat) was begun within two hours of receipt of the samples. The method of Thomas, *et al (43)* was used for the determination. A testing panel of experienced plant personnel judged the milk on arrival at the plant. In addition, physical description of the equipment and management practices were recorded on a monthly basis.

The four pipeline types were designated as A, B, C and D. There were five installations for each of Type A, Type B, Type C, and eight for Type D. During 1960, studies were continued on one of each of the four pipeline types and on one of the bucket-type milking installations. The data presented is on one of each type installation and these are representative of the data obtained from each type installation.

RESULTS

Poor Pipeline Installations

These were either improperly installed types of poor design or inadequately managed during the milking operation. There were three pipeline milker types in this category - Types A, B and C as follows:

Type A. These installations used 1.5-in pyrex lines with a dome type filter located between the milk hose and the main line. A centrifugal pump moved the milk from the receiving jar to the bulk tank.

[1]Presented before the Spokane Sanitarians and Dairy Fieldmen's Meeting, March 17, 1961, at Spokane, Washington.

Other physical details and management factors are shown in Table 1. Churning occurred at the in-line filter. Excessive foaming was due to numerous air leaks in the system. Four to 6 samples were collected during each of 23 months for a total of 98 samples. Results of the acid degree determinations were averaged for each month and are shown in Figure 1.

According to Thomas, *et al (43)*, discriminating flavor judges are able to detect rancidity when the acid degree is equal to approximately 1.20. This threshold value is indicated on Figures 1-5 by a dashed line. With Type A installations, the acid degree value, except for summer months, was above this level. Although suggestions were made to the farm operator on improvements that could be made in this installation, data in Table 1 shows that no attempt was made to alter conditions of operation.

Sixty-two percent of the herd (Holsteins and Guernseys) were in an advanced stage of lactation during the period of July to October. However, this did not appear to be a factor in the development of rancid flavor for this season of the year. A high degree of rancidity did develop during the remainder of the year.

In Type A installations, the major factors that appeared to contribute to rancidity development were foaming and churning during the dry feed season. Factors involved were: *(a)* air leaks at the claw and other sections of the system; and *(b)* excessive agitation at the in-line filter and by the centrifugal pump. Other factors that seemed to correlate with the development of the rancid flavor included the lack of a shut-off valve at the claw and milk valves in the vertical position which contributed to increased agitation.

Type B. These installations also used 1.5-in pyrex lines. A sleeve-type filter was used between the milk hose and the main line. The milk was moved from the collecting jar to the bulk tank by use of a centrifugal pump. Other physical and management factors are shown in Table 2. Partial churning occurred at the in-line filter and excessive agitation was observed in the 18-in riser. Although this system had a shut-off valve at the claw, numerous air leaks in the system contributed to foaming and additional churning. Four to 6 samples were collected at weekly intervals during 23 months for a total of 100 samples. The results shown in Figure 2 indicate the acid degree value to be above 1.20 from January through the middle of May, 1959. Removal of the riser in April, 1959 appeared to be a factor in the reduction of the acid degree value level for the period January-April, 1960. It is more probable, however, that the amount of foaming and churning during the two year study was not equal in magnitude and contributed partly to the differences in the observed decrease in acid degree value level. The most probable causes observed for the increased acid degree value during the latter part of the dry feed season were: *(a)* foaming due to air leaks at the milk tube, teat cups and loose fittings; and *(b)* churning due to agitation at the in-line filter, foaming and the centrifugal pump. Again, advanced stage of lactation (70% during the period of August through November) did not appear to be a factor.

TABLE 1. PHYSICAL DATA AND MANAGEMENT FACTORS ON TYPE A PIPELINE SYSTEM (NO. 117). TOTAL LENGTH OF LINE 92 FT; HEIGHT - 66 IN; LINE SLOPE - 1.5 IN PER 10 FT. NO RISERS, IN-LINE FILTER *R SHUT-OFF VALVE; ALL VALVES POSITIONED AT BOTTOM EXCEPT ON 12-59.

	Milking condition										Herd management							
Date	1	2	3	4	5	6	7	8	9	10	a	b	c	d	e	f	g	h
2-59	+	−	+	−	−	+	+	+	−	−	+	+	+	−	+	−	−	+
3-59	−	−	+	−	−	+	+	−	−	−	+	+	+	−	+	−	−	+
4-59	−	−	+	−	−	+	+	+	−	−	+	+	+	−	+	+	−	−
5-59	−	−	+	−	−	+	+	+	−	−	−	+	+	+	−	+	−	+
6-59	−	−	+	−	−	+	+	+	−	−	+	+	+	+	−	−	−	−
7-59	−	−	+	+	−	+	+	+	−	−	+	+	+	+	−	+	+	−
8-59	−	−	+	−	+	+	+	+	−	−	+	+	+	+	−	−	+	−
9-59	−	−	+	+	+	+	+	+	−	+	+	+	+	−	+	+	+	−
10-59	+	−	+	−	−	+	+	+	−	−	+	+	+	−	+	−	+	+
11-59	−	−	+	−	−	+	+	+	−	−	+	+	+	−	+	−	−	−
12-59	−	−	+	−	−	+	+	+	−	−	+	+	+	−	+	−	−	−
1-60	+	−	+	−	−	+	+	+	−	−	+	+	+	−	+	+	−	−
2-60	−	−	+	+	−	+	+	+	−	−	+	+	+	−	+	−	−	−
3-60	+	−	+	+	−	+	+	+	−	−	+	+	+	−	+	−	−	−
4-60	−	−	+	−	−	+	+	+	−	−	−	+	+	−	+	−	−	−
5-60	−	−	+	−	−	+	+	+	−	−	+	+	+	+	−	−	−	−
6-60	+	−	+	−	+	+	+	+	−	−	+	+	+	+	−	+	−	−
7-60	−	−	+	+	+	+	+	+	−	−	+	+	+	+	−	−	+	−
8-60	−	−	+	−	+	+	+	+	+	−	+	+	+	+	−	+	+	+
9-60	−	−	+	−	−	+	+	+	−	−	+	+	+	−	+	−	+	−
10-60	−	−	+	−	+	+	+	+	−	−	+	+	+	−	+	−	+	−
11-60	−	−	+	+	−	+	+	+	−	−	+	+	+	−	+	−	−	−
12-60	−	−	+	−	−	+	+	+	−	−	−	+	+	−	+	−	−	−

Legend:

1. Loose fittings at joints
2. Low milk-flow rate
3. Air leaks at claw
4. Air admitted at teat cups
5. Air leaks at milk tube of milking machine
6. Excessive agitation in milk line
7. Foam formation in milk line
8. Violent centrifugal pump
9. Slow cooling and excessive agitation in bulk tank
10. Gasket absent at the line unions

a. Over-milking of cows
b. Improper stimulation before milking
c. Milking too slowly
d. On pasture
e. Dry feed (grass silage, alfalfa hay and grain)
f. Changing helper
g. High percentage of cows in advanced lactation
h. High percentage of mastitis cows.

(+) Yes
(−) No

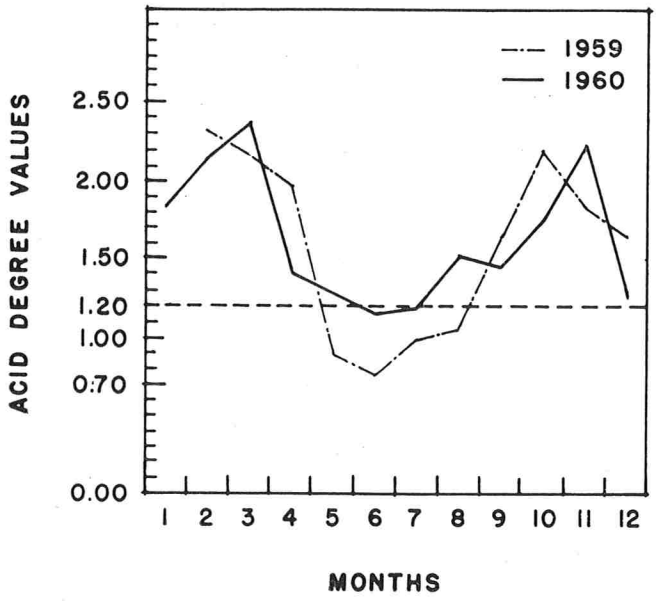

Figure 1. Average acid degree values of milk samples from Type A pipeline system No. 117. (98 samples)

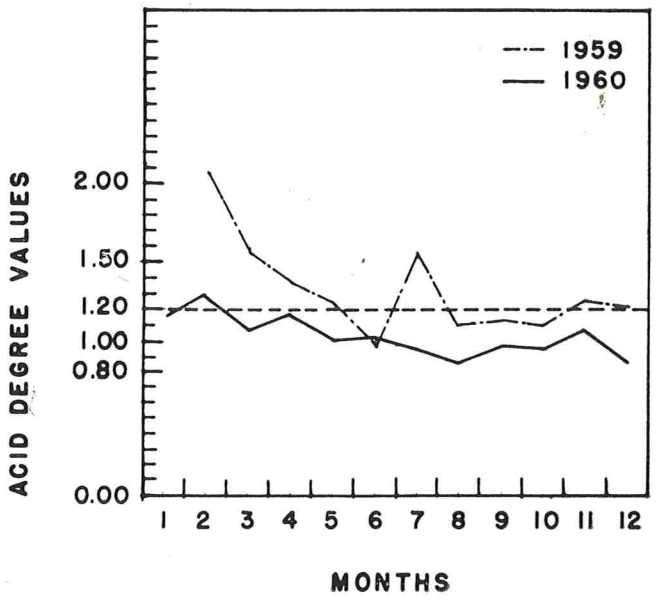

Figure 3. Average acid degree values of milk samples from Type C pipeline system No. 118. (101 samples)

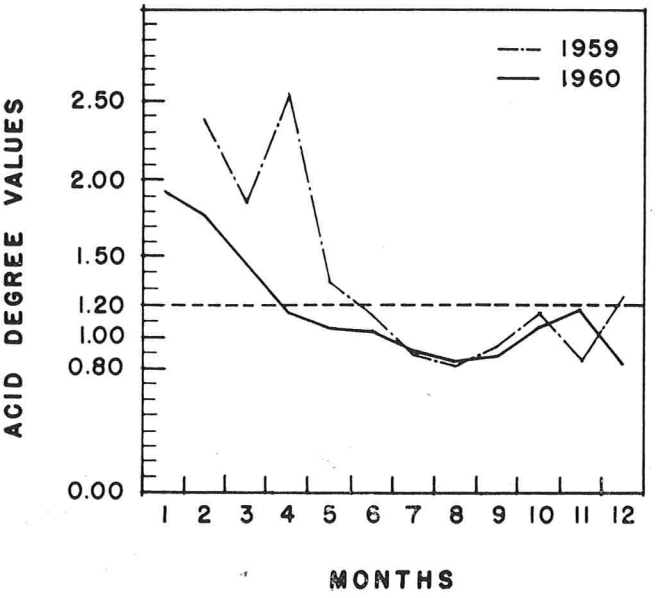

Figure 2. Average acid degree values of milk samples from Type B pipeline system No. 114. (100 samples)

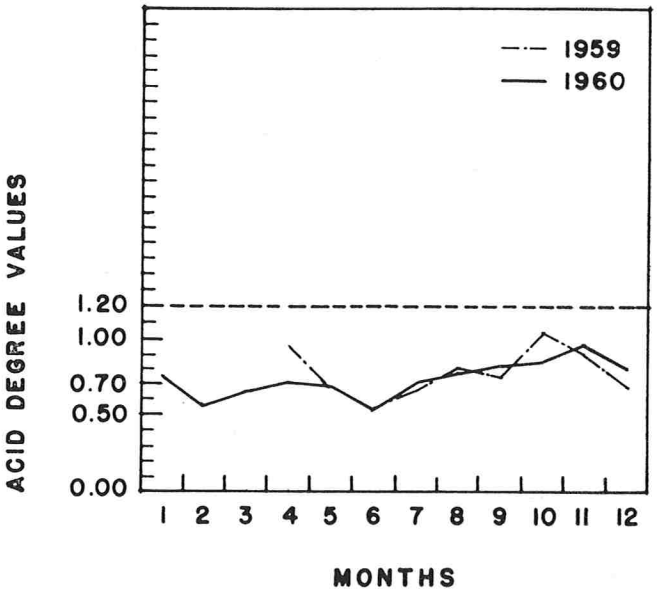

Figure 4. Average acid degree values of milk samples from Type D pipeline system No. 182. (89 samples)

Type C. These installations used 1.5-in stainless steel pipelines and a centrifugal pump for conveying the milk from receiver jar to bulk tank. However, the filter was of the gravity type located above the bulk tank. Other physical and management factors are detailed in Table 3. Four to 8 samples were obtained at weekly intervals for each of 23 months for a total of 101 samples. The acid degree value was above 1.20 for the months of February through May, July, November and December, 1959 (Figure 3). Correcting the line valves to side positions and eliminating air leaks at the claw, together with lessened agitation in the milk line (Table 3), appeared to have reduced the level of acid degree in the milk to less than 1.20 during the 1960 study. As in the study of Types A and B installations, the advanced stage of lactation of the majority of cows (July-November) did not appear to be a factor in the development of rancidity in the mixed herd milk (Table 3).

Good Pipeline System

Type D. These installations included a 1.5-in stainless steel pipeline and a centrifugal pump which moved the milk from the receiver jar to the bulk tank. The filter was in the milk tube near the claw. No shut-off valve was used in this type of installation.

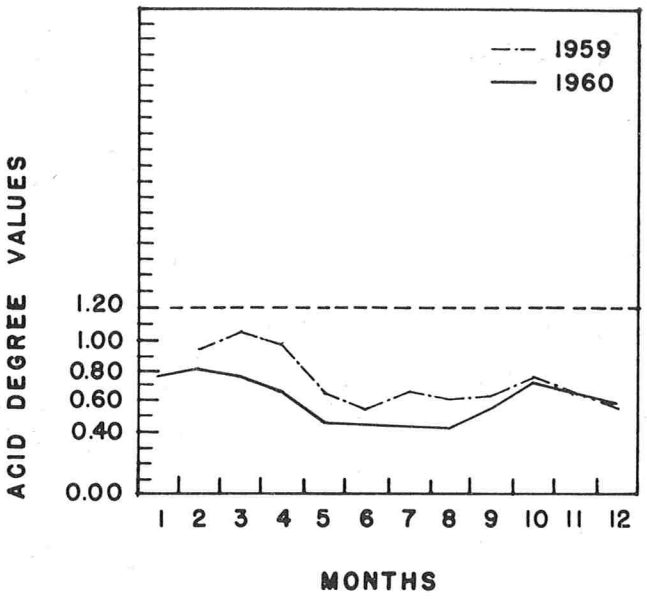

Figure 5. Average acid degree values of milk samples from bucket type milker No. 150. (92 samples)

TABLE 2. PHYSICAL DATA AND MANAGEMENT FACTOR ON TYPE B PIPELINE SYSTEM (NO. 114). TOTAL LENGTH OF LINE - 61.9 FT; HEIGHT - 72 IN; LINE SLOPE - 1.6 IN PER 10 FT. ONE 18-IN RISER PRESENT ON 2-59, 3-59 AND 4-59 ONLY; IN-LINE FILTER AND SHUT-OFF VALVE PRESENT; ALL VALVES POSITIONED AT BOTTOM EXCEPT ON 12-59.

	Milking condition										Herd management							
Date	1	2	3	4	5	6	7	8	9	10	a	b	c	d	e	f	g	h
2-59	+	+	−	+	+	+	+	+	−	−	+	+	−	−	+	−	−	−
3-59	−	−	−	+	+	+	+	−	−	−	+	+	−	−	+	−	−	−
4-59	−	−	−	+	+	+	+	+	−	+	+	+	−	−	+	−	−	+
5-59	−	−	−	+	+	+	+	−	−	−	+	−	−	+	−	−	−	−
6-59	−	−	−	+	+	+	+	−	−	−	+	−	−	+	−	−	−	−
7-59	−	−	−	+	−	+	+	−	−	−	+	−	−	+	−	−	−	−
8-59	−	−	−	+	−	+	+	−	−	−	−	−	−	+	−	−	+	−
9-59	+	−	−	+	−	+	+	−	−	−	−	−	−	+	+	−	+	−
10-59	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	+	+
11-59	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	+	−
12-59	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	−	−
1-60	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	−	−
2-60	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	−	−
3-60	−	−	−	+	−	+	+	−	−	−	−	−	−	−	+	−	−	−
4-60	−	−	−	−	−	+	+	−	−	−	−	−	−	−	+	−	−	−
5-60	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−
6-60	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−
7-60	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−
8-60	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	+	−
9-60	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	+	−
10-60	−	−	−	−	−	+	+	−	−	−	−	−	−	−	+	−	+	−
11-60	−	−	−	−	−	+	+	−	−	−	−	−	−	−	+	−	+	−
12-60	−	−	−	−	−	+	+	−	−	−	−	−	−	−	+	−	−	−

Legend: See Table 1.

TABLE 3. PHYSICAL DATA AND MANAGEMENT FACTORS ON TYPE C PIPELINE SYSTEM (NO. 128). TOTAL LENGTH OF LINE - 32 FT; HEIGHT - 58 IN; LINE SLOPE - 1.3 IN PER 10 FT. NO RISERS OR SHUT-OFF VALVE; GRAVITY FILTER USED; ALL VALVES POSITIONED AT BOTTOM EXCEPT ON 1-60.

	Milking condition										Herd management							
Date	1	2	3	4	5	6	7	8	9	10	a	b	c	d	e	f	g	h
2-59	+	+	+	+	+	+	+	−	−	−	−	−	+	−	+	−	−	−
3-59	−	−	+	+	−	+	+	−	−	−	−	−	+	−	+	−	−	−
4-59	−	−	+	−	−	+	+	−	−	−	−	−	−	−	+	−	−	−
5-59	−	−	+	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−
6-59	−	−	+	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−
7-59	−	−	+	−	−	+	+	−	−	+	−	−	−	+	−	+	+	−
8-59	−	−	+	−	−	+	+	−	−	−	−	−	−	+	−	+	+	−
9-59	−	−	+	−	−	+	+	−	−	−	−	−	−	+	−	+	+	−
10-59	−	−	+	−	−	+	+	−	−	−	−	−	−	−	+	−	+	−
11-59	−	−	+	−	−	+	+	−	−	−	−	−	−	−	+	−	+	−
12-59	−	−	+	−	−	+	+	−	−	−	−	−	−	−	+	−	−	−
1-60	−	−	+	−	−	−	+	−	−	−	−	−	−	−	+	−	−	−
2-60	−	−	−	−	−	−	+	−	−	−	−	−	−	−	+	−	−	+
3-60	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−
4-60	+	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−
5-60	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−
6-60	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−
7-60	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	+	−
8-60	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	+	−
9-60	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	+	−
10-60	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	+	−
11-60	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	+	−
12-60	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−

Legend: See Table 1.

Other physical and management observations are shown in Table 4. Four to 5 samples were obtained at weekly intervals during each of 22 months for a total of 89 samples. During the two year period, the acid degree values remained below 1.20 (Figure 4). The installation was carefully managed with very little foam production during the milking operation, and apparently with minimum agitation since there was no evidence of partial churning.

Bucket Type System

Milker installation results from 92 samples collected at weekly intervals over a period of 23 months are shown in Figure 5. Acid degree values remained at or below 1.00 for the entire period of the experiment.

Seasonal Effects

Definite seasonal effects appear to be represented in the data for the milk produced with Types A, B and C pipeline systems. The effect of late stage of lactation seems to be ruled out since the majority of animals were in the advanced lactation stage in late summer and through the fall months. The other probable factor, as mentioned previously, is the ef-

fect of dry feed, however, all systems studied did not reveal this trend. It is assumed that the differences noted are due to the physical handling of the milk by the different systems, with dry feed being a contributing factor.

Flavor Panel

The members of the flavor panel detected definite rancid flavors at the acid degree value level of 2.0 or higher (Table 5).

DISCUSSION

From the data obtained, the primary cause of rancidity development in milk produced with pipeline milking systems appeared to be the physical handling of the milk, causing foaming and partial churning. Foaming, the earliest stage of churning, is brought about by excessive admittance of air at the claw, teat cups, milk hose and loose line joints. The foaming was increased when risers were present and the flow-rate of the milk was low. Agitation of the milk was excessive. Such agitation may be due to air leaks, obstructions in the system, such as may be provided by the type of filter employed, position of valves, non-flush type gaskets, long pipelines, risers and centrifugal pumps with low rate of

TABLE 4. PHYSICAL DATA AND MANAGEMENT FACTORS ON TYPE D PIPELINE SYSTEM (NO. 182). TOTAL LENGTH OF LINE - 27 FT; HEIGHT - 50 IN; LINE SLOPE - 1.9 IN PER 10 FT. NO RISERS OR SHUT-OFF VALVE PRESENT; VALVES POSITIONED AT SIDE AND FILTER PRESENT IN MILKING UNIT.

	Milking condition										Herd management							
Date	1	2	3	4	5	6	7	8	9	10	a	b	c	d	e	f	g	h
4-59	+	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–	–
5-59	–	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–	–
6-59	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–
7-59	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
8-59	–	–	–	–	–	–	–	–	–	–	–	–	+	+	+	–	–	–
9-59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
10-59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
11-59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
12-59	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
1-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
2-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
3-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
4-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
5-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
6-60	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
7-60	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
8-60	–	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–
9-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
10-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
11-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
12-60	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–

Legend: See Table 1.

TABLE 5. INFLUENCE OF VARIOUS MILKING UNITS ON RANCIDITY DEVELOPMENT AT 38°C STORAGE

			Acid Degree Values of Milk Samples from Pipeline Milker Systems				
Pipeline milker No.	Trial	Flavor	Initial	After 24 hrs.	After 48 hrs.	After 72 hrs.	Increase
A-117	1	Rancid	2.22	2.44	2.64	2.82	0.60
	2	Rancid	2.64	2.87	3.22	3.36	0.72
	3	Good	1.47	1.58	1.59	1.69	0.22
	Mean		2.11	2.30	2.48	2.62	0.51
B-114	1	Rancid	2.66	2.80	2.78	2.86	0.20
	2	Rancid	2.13	2.15	2.42	2.56	0.43
	3	Good	1.47	1.62	1.67	1.68	0.21
	Mean		2.09	2.19	2.29	2.37	0.28
C-128	1	Good	1.00	1.02	1.11	1.20	0.20
	2	Good	1.07	1.13	1.22	1.33	0.26
	3	Good	1.10	1.15	1.24	1.41	0.31
	Mean		1.05	1.10	1.19	1.31	0.26
D-182	1	Good	0.84	0.89	0.78	0.86	0.02
	2	Good	0.71	0.79	0.77	0.70	-0.01
	3	Good	0.73	0.70	0.73	0.82	0.09
	Mean		0.76	0.79	0.76	0.79	0.03
			Acid Degree Values of Bucket Milker Milk Samples				
No. 150	1	Good	0.66	0.60	0.67	0.64	-0.02
	2	Good	0.60	0.58	0.65	0.62	0.02
	3	Good	0.60	0.62	0.65	0.63	0.03
	Mean		0.62	0.60	0.66	0.63	0.01

milk flow. Another factor that may be conducive to churning, but not studied in this work, is that during the winter, the pipeline may be cold when the first milk of each milking passes through. This may cool the first milk to a temperature during which the milk will churn very rapidly. This, of course, disrupts the protective film of the fat globules and exposes the fat to lipase enzymes.

Seasonal factors undoubtedly play a part. Less incidence of rancidity was noted when the cattle were on green feed than when they were on dry feed (Tables 1-4 and Figures 1-5). This is in agreement with reports of earlier workers *(2, 3, 4, 5, 9, 22, 24)* showing that milk produced during the pasture season was less susceptible to rancidity development than milk produced during a period of dry feeding. Also many reports *(3, 5, 9, 10, 11, 16, 22, 23, 34, 35, 37, 38)* show that late lactation milk, coupled with dry feeding, results in the production of milk which is more likely to show spontaneous rancidity development. Under such circumstances, it is reasonable to assume that such milk is also more easily conditioned to lipase activity by foaming and churning conditions.

Under the conditions of this study, milk produced during the pasture season tolerated physical abuse better than milk produced during the dry feeding period, as evidenced by less incidence of rancidity. It is, therefore, very important to insure the proper operation of pipeline milker systems to minimize air leaks (foaming) and other churning factors which are the conditioning factors for the development of hydrolytie rancidity of milk fat. As milk is cooled, absorption of lipase on fat globules appears to enhance lipolysis *(12, 13, 14, 15, 18, 26, 27, 39, 40)*.

Although there are reports *(6, 44)* that there is no significant increase in acid degree values in milk after 48 hours at the storage temperature, the data in Table 5 shows that hydrolysis does continue in susceptible milk for at least 72 hours.

Slow cooling and excessive mechanical agitation in the bulk tank also may be a problem, but no evidence was found in these experiments to substantiate this.

Since laboratory records of each producer's samples during the two year period of the study do not show unacceptable bacterial counts or evidence of growth of psychrophilic bacteria, therefore, it is reasonable to assume that hydrolytic rancidity could not be attributed to the action of bacterial enzymes.

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BACTERIOLOGICAL TESTING OF UTENSILS FOR QUALITY CONTROL IN AN OYSTER SHUCKING PLANT

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TABLE 1. RESULTS OF SWAB TESTS OF VARIOUS SURFACES

Source of sample	Most probable number of coliform bacteria per 3 square inches	
	Initial examination	After corrective action
Shucking knife	>7,000	91
Shucking block	7,000	91
Shucking pail	1,300	930
Shucking table	2,400	91
Washer tank[1] No. 1	<45	430
Washer tank[1] No. 2	60	430

[1]During the initial examination, washer tanks were flushed with clear water before swabbing. After corrective action washer tanks were swabbed without rinsing.

The usual practice for in-plant sanitation control in an oyster shucking and packing plant depends upon continued efforts of management to achieve conditions of maximum cleanliness. This, combined with periodic inspection visits by a sanitary engineer or sanitarian and frequent bacteriological examinations of the finished product completes the sanitation program. With dependence on visual inspection techniques only, it is often impossible to pinpoint sources of contamination of the product. It is the object of this paper to describe a method suitable for identifying trouble spots and also to show some results of the application of the method.

Swab testing procedures for the determination of the bacteriological quality of utensils *(1)* have long been used in the evaluation of dishwashing practices in restaurants. These methods have been applied to operations involving food production to only a limited extent. Use of a modified bacteriological swab test for surfaces and utensils with which oysters come in contact is discussed here. The method approved for bacteriological examination of food utensils in California *(2)* was used throughout this work with one major exception. This exception was that instead of making a total plate count for the enumeration of all bacteria, a series of lactose broth tubes was inoculated to determine the most probable number (MPN) of coliform bacteria. Since coliform bacteria are the indicators most used in the laboratory analysis of the sanitary quality of oysters, this modification provided a means for correlating swab results with other tests performed in shellfish control. The area swabbed routinely was three square inches per utensil or surface.

An oyster plant in Northern California which has been experiencing difficulties in terms of the sanitary quality of the end product was selected for making before and after surveys. As an example, the data in Table 1 show analyses of a variety of samples within the plant. Following the first set of observations, a series of recommendations was made to management for improving the sanitation practices used in the shucking process. These recommendations covered both general operations and more specifically utensil sanitation.

After these observations and recommendations the following process changes were made:

1. A hypochlorinator was installed to inject a chlorine solution into water used for washing shellstock coming into the plant.
2. An elevator-conveyor was installed to distribute ice among the shellstock as the hopper was loaded.
3. Water used for washing shucked oysters was pre-cooled to 44°F.
4. Flow of oysters from the shucking bench to packing of finished product was improved so that all oysters are processed within one hour at temperatures below 50°F.
5. More frequent washing and disinfection of shucking knives, blocks, and gloves was carried out.

It had also been recommended that a steam generator be installed in the plant to provide a source of steam for sterilizing shucking pails and washers between each use and for sterilization of the shucking table and storage bins after completion of the day's operation. No action was taken on this recommendation.

TABLE 2. COLIFORM COUNTS OF OYSTERS

	Most probable number of coliform bacteria per 100 ml of oyster liquid			
	Initial examination		After corrective action	
	Shell	Shucked	Shell	Shucked
Median	2350	3300	490	790
Number of samples	14	24	15	39

A repeat examination made after the changes were completed showed a remarkable reduction in coliform count on the shucking utensils which received additional disinfection treatment. Not only was there improvement in the sanitary quality of the utensils used in the operation, but also an improvement in the finished product. Table 2 shows results obtained before the initial examination and after corrective action.

It has been shown that a swab test of utensils and surfaces, coupled with an estimation of the numbers of coliform bacteria on these surfaces is a useful adjunct to visual observation in locating sources of contamination of the finished product in an oyster shucking and packing plant. Use of this procedure also helps to develop confidence by industry toward the enforcement agency by providing a means for demonstration of problem elimination by cooperative efforts. It is recommended that this or similarly useful procedures be applied more extensively to the sanitary investigation of oyster shucking and packing operations.

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FUTURE IMPERFECT[1]

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A look into the future of sanitation sees an increasingly higher level of responsibility and professional achievement. In particular, with respect to food, the need for further research, advanced training, and appropriate preventive measures is underlined by the increasing complexity and articulation of the system of food protection, processing, and distribution. The complexity and articulation of urbanized society even requires that the sanitarian assume some of the stature of a statesman or political scientist. While professional alliances are important in this prospect, essentially the drive of dedicated individuals is what will carry the profession and society to new levels of achievement. An important instrument in this drive is the body of professional literature which is both the possession and product of those who serve public health.

The 50th milestone has two advantages. It is first of all a great satisfaction to have reached it at all. Take it from one who knows. Second, it is an occasion for reflection, not only for reviewing the history but for taking bearings for the next 50 years.

This anniversary is a reminder that you are carrying on a tradition that is as old as any in our civilization. Indeed, sanitation is the bed-rock of civilization: Even without other records of the past, the remnants of ancient cities tell us that the oldest civilizations understood the need to protect the public from its own by-products and from the mischief of nature.

While scientific theories and technologies have been modified since the first cities grew along the Nile, certain fundamental policies have persisted, such as the belief that life is good, that it should be preserved and protected. This sounds about as obvious as one can be, but it isn't necessarily so. If life must be protected, most people prefer to protect their own. The lives of others usually are secondary. At times, murder has been a considered act of public policy. At others, it has been the accepted by-product of commercial enterprise.

The other day, one of your associates, after an enjoyable lunch, realized he had to return to his work and said, a bit wearily, "Well, I have to go back to saving lives." He thought he was joking, but actually he was more in earnest than he realized. The business of saving lives is not to be taken for granted at anytime. But it has been the persistent theme of sanitation.

If there has been any critical, strategic change in sanitation since this Association was founded, it is a shift in basic strategy, from the simple to the complex, from a plain cause and effect situation to one where a multitude of factors move into the act. It is the difference between a game of marbles and a game of basketball with 30 players, five basketballs, and no time out. This is a basketball game, incidentally, which is remarkably free of scandals.

In these conditions, new strategies of sanitation have to be invented. Leon Buchbinder recently published in *Public Health Reports* a paper which recommended several steps to reduce food poisoning. To summarize his ideas here may not do them justice, but the main recommendations clearly identify the increased professional responsibilities in sanitation. These are indicated by the need for an expanded program of research, advanced professional education, and a stronger course of public education, including specialized training of students in secondary schools. Improved detection and reporting of food

[1]Keynote address given at the 48th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Des Moines, Iowa, August 14-17, 1961.
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poisoning is only the beginning. Research is needed to determine the major factors, some of which may not even be suspected today. Following research, appropriate preventive action may be taken, with respect to administration, public education, equipment design, process control, microbiological standards, and enforcement procedures. He proposed a national study committee to spearhead a concerted, nationwide, research program as the basis for a new era in food control.

For another glimpse into the future of milk and food sanitation, the Midwest Research Institute has published proceedings of a 1957 symposium on the future of food preservation. Probably there have been even more recent exercises with the crystal ball, including the conference sponsored by the National Research Council-National Academy of Sciences on microbiological standards. But the 1957 information on freeze-drying, radiation, and chemical additives in itself opened a thousand windows on the future of food sanitation. Bring in ultra high frequency cooking, powdered juices, ultrasonic dishwashers, and instant food and you have a thousand more in view.

With this growing complexity in the food industry, and the increasing knowledge and technical ability required of the sanitarian, you have to run like mad to keep from falling behind. To some, the increasing demands on time and brains is not entirely welcome. At a meeting of public health nurses, a psychologist proposed with great enthusiasm a special household survey to prevent home accidents. He was warming up to his theme when one girl in the audience groaned, "Something else added to the case load." But like it or not, the case load gets heavier with each step upward in responsibility.

Another example is a fellow who had been promoted to a top job in a Federal agency. His first week on the job found him absolutely snowed under with paper, almost too busy to look up. In real amazement, he said, "You know I always used to think that when you were promoted this high, all you had to do was sit back with your feet on your desk and think. Since I've been in here," he said, "I've worked harder and longer hours than ever before in my life." But he was in no mood to resign. He was loving every minute of it.

The point of this is that those who seek professional advancement usually pay a price. The higher the status and the larger the pay, the heavier the workload, among honest public servants.

It is possible to become rich and famous by accident or luck, and to make a lot of money gambling, but those who work for a living usually find that the more they earn, the more is expected of them.

To anyone with an interest in history, it is interesting to see how the individual's concern with the future builds up into a system of alliances and rivalries. Although we firmly believe in teamwork, each separate calling in the public health field tends to form a separate professional discipline, and a certain amount of competition among the disciplines is unavoidable. This competition has both its virtues and its disadvantages. It is a disadvantage that each discipline tends to form a closed guild by itself. And each guild tries to build up its own importance, and budget, and salary level within the general system. Usually you have the MD at the nucleus, and circling around like electrons are the nurses, dentists, engineers, veterinarians, sanitarians, business managers, health educators, technicians, statisticians, and general maintenance workers. As a result it often seems that public health looks more like a loose coalition of independent disciplines than a championship basketball team.

On the other hand, it is healthy to have a number of ambitious people striving to lead the fight for public health. It has to be remembered, though, that the great leaders were not the sort who wore the old school tie. They were not organization men. They were dedicated individuals who achieved eminence not because they wore the right label but because they had the right ideas, the right information, the right abilities.

You men know the roll of honor probably better than I do: Shattuck, a publisher; Chadwick, a lawyer; Snow, an anesthetist; Addams, a social worker; Nightingale, a society lady; Riis, a reporter; Winslow, a bacteriologist; Pasteur, a chemist; Lasker, an advertising man; Strauss, a merchant; and so on. It also is worth remembering that Winslow liked to identify himself as a sanitarian; so did Dr. Rosenau. The title does honor to those who honor the title.

Whoever is to lead the work for public health, the job belongs to no one by divine right. It is not hereditary. The leadership falls to those who earn it, as Mark Hollis likes to say.

A crystal ball might reveal in the next 50 years a remarkably stronger position for sanitarians in the public health family. Today, sanitarians have the strength of numbers. They have the advantage of occupying a front row seat where they know what is really going on in the kitchens and the markets. And they are rapidly acquiring more and more of the highly specialized knowledge and techniques which separate the professionals from the journeymen.

The movement is in part a reflection of your own, dedicated ambitions. It is, in part, also a reflection of the increasing complexity of health administration, with the consequent demand for highly skilled and sophisticated services. The great expansion in the in-service training programs, to which the Public Health Service contributes so much, is a further reflection of this trend.

The duties of sanitarians in years to come are not

only going to be stiffer and more complex, but radically different. Indeed, the years ahead are practically at hand. Last year in Philadelphia, a seminar on Behavior and Environment indicated that sanitarians are expected to be not only lawyers, chemists, radiologists, detectives, and entomologists; you also have to be psychologists, sociologists, and political scientists.

To put it another way, you have a new business. Call it metropolitan organics, or metropolitan dynamics, if you like. In the years ahead, the piece-meal management of sanitation is going to be futile unless the metropolitan area as a whole is in shape to support a sanitation program. For example, if the highways are jammed, the milk trucks and the frozen food trucks will sit cooking in the sun. If the schools are neglected, the kitchen help will be too ignorant to keep its hands clean. If suitable locations aren't provided for warehouses and pasteurization plants, by a system of planned zoning, it will be that much more difficult to deliver milk and other foods in a wholesome condition. If a neighborhood runs down, or if employment rises and business goes bad, the local grocers are sure to cut corners on refrigeration. When a dozen different jurisdictions, inspections, and laboratories operate in a given region where one alone would serve, valuable man-hours of sanitation are lost forever.

No sanitarian is expected to set up a city planning commission single-handed. But as a key figure in the control of environmental health in the city, he will influence the attitudes of the milk and food industry in the general cause of sanitation, when bond issues come up, when zoning plans are proposed, and when condemnation proceedings begin. He will also advise his own health department, in relations to city plans, of the city's pressing needs as he sees them from his front row seat. He will lift up his eyes to take a long hard look at the city as a whole, and let the city know what he sees.

The original title of this talk was changed from "Today and Tomorrow" to "Future Imperfect", a title probably stolen from Noel Coward. Its theme is that the future is not going to be perfect. You can stand four-square behind that statement. But you men and your organization have an opportunity to make the future more tolerable than it might be otherwise. And in doing so, you will add many new names to the honor roll in public health history.

It would not be in character for an editor not to remind you also that reading and writing are major elements in advancing the cause of public health. Not only does it help to read what others have learned, but in writing up your own experiences and discoveries you also learn a lot more about what you have learned. You become your own critic and supervisor. You learn what you might have done better, and how to do it better. And you put out new lines of communication with others who share your aims and interests. It is no accident that the leaders of society are usually people who use a lot of words, both good and bad.

You have several good journals such as the JOURNAL OF MILK AND FOOD TECHNOLOGY, which carry information of specialized interest in sanitation. PUBLIC HEALTH REPORTS aims more to reach the generalist in public health. This is sanitation, too, in the broadest sense. In such professional reading, you find the information that broadens and deepens your capabilities in your regular duties. Also, many of you have occasion to submit for publication reports of your own significant experiences of broad general interest in public health. If you are uncertain about your writing skills, don't worry about the spelling and punctuation. Simply give the facts in good order, so that they are related to each other, with important details where they will be noticed. The quality of the writing is secondary to the quality of the thinking. Get the facts straight, and they will get into print, as an instrument of professional achievement.

THE PROTECTIVE SCREENING PROGRAM FOR CANNED FOODS[1]

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The National Canners Association (NCA) was founded primarily to improve and maintain consumer acceptance of canned foods. It was with this basic idea that the Association was officially organized in 1907, one year after the passage of the first Federal Food Act. Various divisions of the Association followed the establishment of the first Research Laboratory in Washington, D. C., in 1913. A second laboratory was opened in Seattle in 1919, and a third in San Francisco in 1926 (now Berkeley, California).

The first step in achieving the objective of the Association was to insure universal wholesomeness of canned foods. In order to carry out this aim a number of programs dealing with many phases of the problem have been maintained. One of the most important of these is the educational program designed to develop consciousness among all canners of their responsibility in connection with the canning and selling of only wholesome food. Recognizing, as NCA does, the rights and economic freedoms of the individual and his desire for personal gain, the approach has been one of convincing the individual canner that his long-range personal welfare can be achieved only by providing his consumers with wholesome food.

The continued evolution among canners of this enlightened self interest requires that the NCA keep its program constantly and currently adjusted to all problems as they arise. The pesticide, food additive, and color additive amendments to the Food and Drug Act have presented such problems. Adjustments have been and will continue to be made in the NCA program.

The Protective Screen Program against chemical contamination was instituted and is being carried on by the canner with his growers' cooperation to insure that a wholesome product is delivered to the canning plant. After this, the canner, by controlled processing in hermetically sealed containers (can or glass), further insures the consumer that wholesomeness is maintained until the food is used.

A Program to Prevent Contamination of the Raw Product

Following is an outline of the NCA policy concerning grower use of pesticide chemicals.

Canners processing crops that have been treated, or produced on land that has been treated, with any pesticide chemical—including insecticides, fungicides, rodenticides, herbicides, fumigants, defoliants, nematocides, desiccants, and plant growth regulators—should be absolutely certain that such chemical has been accepted for registration by the U. S. Department of Agriculture under the Federal Insecticide, Fungicide, and Rodenticide Act.

Each canner should ascertain from his State Experiment Station which pesticide chemicals among those accepted for registration under the Federal Act are best suited for use on crops which he processes and then make his selections from these. It should be the responsibility of canners to see that their growers use these registered pesticide chemicals in accordance with the recommendations of the U. S. Department of Agriculture, State Agricultural Experiment Stations, and the Extension Service.

Each canner should make sufficient periodic contacts with his growers to assure himself that if these pesticide chemicals are used, they are used properly. Canners should maintain detailed records showing how pesticide chemicals have been used in the production of crops for processing.

Each canner purchasing crops under contract should obtain written statements from his growers that they will use only registered pesticide chemicals, in accordance with recommended procedures. Canners purchasing canning crops on the open market should obtain written statements from the growers that they used only registered pesticide chemicals, in accordance with recommended procedures.

Canners should participate in the development of an educational program on the proper use of pesticide chemicals in cooperation with their State Agricultural Experiment Station, the Extension Service, producer organization, and other interested groups.

The NCA seeks to promote thorough understanding of the conditions under which pesticide chemicals may be legally used, through personal contacts with canners and by appearances at canners' meetings. Cooperation of the USDA Extension Service, of the Land-Grant Colleges and Experiment Stations, the farm organizations, farm editors and rural newspapers, and canning trade journals, is used to disseminate complete and accurate information on the subject.

A Program to Prevent the Processing of Contaminated Raw Products

Canners should inspect all incoming raw products,

[1]Presented at the 48th Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Des Moines, Iowa, August 14-17, 1961.

and provide for rejection of any that are contaminated with objectionable chemicals which subsequent washing and peeling operations will not surely and completely remove. As has been indicated, the ideal way for control here is to maintain sufficient supervision over field practices in order to know the history of each grower's product. In any case, a system of routine testing and product control is necessary for complete safety. This is not always an easy thing to do and special attention is being given in the NCA Laboratories to the development for industry use of more simple analytical methods for detection of chemical additives. Some tests, such as the fly bioassay procedure, have already been developed and are available for routine work. To pursue the matter further, however, a review is being made of analytical methods employed by FDA, USDA, pesticide manufacturers and recognized commercial laboratories for pesticides or other additives likely to be a problem to the canning industry. Where no simple, accurate procedures exist, research will be undertaken for their development.

Canners without facilities for testing products should have analyses made by a reliable commercial laboratory at frequent enough intervals to assure safety. While the program of the NCA Laboratories does not permit running routine control tests, periodic duplicate check samples for accuracy may be run.

Adequate product washing is a vital step in canning, and many objectionable substances can be removed in this way. The NCA Laboratories have done and are doing extensive research along this line. Canners should routinely review their operations to be sure the product is receiving an adequate wash. Laboratory personnel are available to advise and assist in establishing the best washing procedures for each product.

PROTECTING THE PRODUCT FROM CONTAMINATION IN THE CANNERY

While the first emphasis of this problem has been on pesticides, many other substances are of concern within the processing plant. Some of these materials include detergents for product washing or cleaning, any substances transmitted from a container to its contents, flavoring, and processing ingredients for products which receive pre-canning treatment with chemicals. Some of these materials may be generally recognized as safe or have had prior sanction, others not. The problem is to determine their status under the Food Additives Amendment based on present or intended use. The Color Additive Amendment has added to the in-plant problem with its broad definition of color, the Delaney cancer clause and no prior sanction or grandfather clause.

The canner must be sure of the status of the additives or colors he uses because the responsibility cannot be shifted to ingredient suppliers or others, although guarantees may be obtained to emphasize the duties of all concerned. The canner can check his ingredients against the "generally recognized as safe" (GRAS) lists which FDA has published. It must be remembered that these lists are not all-inclusive and the absence of any material from them does not necessarily mean that the substance is not "generally recognized as safe". When a canner wishes to use any unlisted additive or wants to use one for a purpose other than that approved, or has any question regarding additives or colors, he is urged to check with NCA for guidance or assistance.

Canners are encouraged to keep accurate records on the products, the ingredients, and any factors which may affect the product, and should relate these to can codes. The latter should be changed at frequent intervals so that, if necessary, any lot can be segregated as to source of raw material, ingredients used, or other operating variable. Packers should use only ingredients of food grade and purity, obtained from reliable suppliers, because substances in addition to the desired ingredient could be added from this source.

The NCA Laboratories and legal counsel will continue to work for individual member-canners or groups of canners with FDA on specific additive or color problems, and will assist industry in getting FDA clearance for chemicals which are considered unavoidable or necessary in the production of good quality canned foods. Additions to the list of additives generally recognized as safe will be called to the attention of the industry as new materials are considered by FDA. As one means of keeping industry informed, opportunities are sought to explain the food additives question to canners' groups throughout the country.

The Laboratories will keep in touch with other agencies, such as National Research Council committees, university food technology departments, etc., on the additives problem so that all interested groups can work toward a common goal. NCA members will be assisted in locating sources of information on previous usage or testing of additives.

In addition to examining occasional duplicate samples for canners as a check on the accuracy of their company analysts, the NCA Laboratories will help in any emergency. With a limited staff it is, of course, necessary to avoid routine control work if the entire industry is to be given adequate service of this kind.

In-plant control of additives extends into the sanitation program of the Association. A continual program of assistance and advice on good house keeping and sanitation is carried on. This activity is based

principally upon industry conferences and individual plant surveys.

Sanitation conferences are being held throughout the country aimed at line or operating personnel including superintendents, foremen and foreladies. Prevention of product contamination is one of several topics that is thoroughly discussed. This is one of many methods for dissemination of information on current sanitation practices to personnel that may not be reached by scientific or trade publications.

Plant surveys or inspections are conducted by the Laboratories, upon request, as a supplement to the companies' own program. During their visits to the plants any problem which may confront the company can be discussed. In addition, a report of sanitary conditions observed in the plant is given to management. Assistance in training sanitation personnel is also available to members.

One area of the sanitation program not directly related to additives that may be of interest is the sanitary design of canning equipment, which is fundamental to cleaning and maintenance. The NCA Committee on Sanitation of Canning Equipment is composed of staff members, representatives of canning companies and a liaison member representing the Canning Machinery and Supplies Association. Recommendations have been published on horizontal belt conveyors, drum type blanchers and tomato or fruit washers. The material on post-cooling can handling equipment is ready for publication. Other equipment is under consideration at the present time and further work in this field will be continued.

The aim of the National Canners Association is to assure consumers of canned foods of a "clean wholesome product packed in a clean plant".

NEWS AND EVENTS

Editor's Note — From time to time during the past few months, mention has been made in the Journal of the so-called Gross Committee, or, using the complete title, the Committee on Environmental Health Problems. The completed Committee report is now in printed from and totals nearly three hundred pages. In this month's issue of the Journal we publish the last third of the report by the Sub-Committee on Milk and Food. We believe this is a highly significant report and that our members should know the findings and recommendations of this expert Committee. For those wishing the complete report covering all phases of environmental health, copies may be procured from the Public Health Service.

REPORT OF THE SUBCOMMITTEE ON MILK AND FOOD

Problem Areas and Goals

Industry, enforcement agencies, and the public need the assistance of a national organization primarily concerned with health problems, which can work and be the focal point of leadership in a lattice of other governmental and private organizations to provide the inspiration, information, guidelines and resources necessary for food protection. The Public Health Service has an obligation to meet this need in such a way that it will engender the confidence and cooperation of all concerned. It must avoid, on the one hand, a fragmentary approach which cannot give adequate and timely answers to new problems being evolved or, on the other hand, an overly comprehensive program that tends to duplicate and infringe on the primary responsibilities of other organizations. Particular attention should be given to health-related problems which require the participation of a public agency for the protection of the consumer's interest and to those areas of environmental health where food indirectly may play a decisive role in human welfare.

The proposed overall mission is to improve and protect the public health and welfare as they may be affected by foods and beverages, alone or in combination with other environmental stresses. The primary objectives include:

1. Detection of microbiological, chemical, and nutritional health hazards which have been and will continue to be introduced as the result of changes in food production, procurement, processing, packaging, marketing, and serving.
2. Reappraisal of food-protection measures now in use as they are affected by changes in technology and food-handling practices.
3. Surveillance of developments in science and technology as they may potentially affect food protection.
4. Development and maintenance of a basic-data program on trends of public health hazards associated with food production, processing, and distribution.
5. Invesitgation and development of methods to prevent or reduce health-hazard problems confronting the food industries.
6. Application of the accumulated knowledge to improve public health practice.

Major problem areas, which are expected to be of continuing importance during the next decade or longer, are noted below, together with comments on their significance and some suggested approaches to their solution.

Microbiological Contaminants of Foods

The notable successes of the past 50 years in con-

trolling botulism, typhoid fever, and other severe foodborne diseases, have tended to create an impression that technical knowledge in this area is adequate to prevent all infections and intoxications of microbial orgin. However, the facts are that gastroenteric episodes continue to occur at a rate second only to respiratory infections, among the short-term illnesses suffered by middle-class American families. Current food sanitation practices have failed to reduce the high incidence of foodborne diseases during the past 8 years. Although the majority of outbreaks either go unrecognized by health authorities or are of undetermined etiology, a growing body of evidence indicates that hitherto unsuspected fungi, bacteria, viruses, rickettsiae, and protozoa may be partially responsible. For example, infectious hepatitis has been traced to consumption of polluted shellfish, first in Sweden, and on two more recent occasions in the United States. *Clostridium perfringens,* which has long been associated with foodborne gastroenteritis in Great Britain is only now beginning to receive serious consideration in U. S. health departments. The first official reports of such outbreaks were received by the Public Health Service less than 2 years ago.

Well-known types of food-poisoning organisms occur frequently in a variety of foods. Raw market milk supplies nearly always contain *Staphylococcus aureus.* Dried or frozen egg products are notable sources of *Salmonella* organisms. When these products are used for manufacturing purposes, they may cause serious contamination of the finished product, as happened in the case of commercially marketed hollandaise sauce. Outbreaks of *Salmonella typhimurium* were reported from Los Angeles, Calif., and St. Paul, Minn., in mid-June 1961. The hollandaise sauce withdrawn from the market was found to contain S. *typhimurium* in lots obtained in San Antonio, Tex., San Fransicso, Calif., Washington, D. C., and St. Paul, Minn. The product was manufactured in New York State.

There are in excess of 600 serotypes of *Salmonella* which may cause illness in man. A sharp increase in cases in the United States due to one, S. *reading,* rarely identified among *Salmonella* isolates from human or animal infections, began in September 1956. During the 12-month period following, 325 acute sporadic cases and 3 outbreaks due to S. *reading* were reported in widely scattered states from Alaska to New York. Obviously, this widespread illness, due to a specific micro-organism, does not follow patterns of water- or milk-borne outbreaks but would be applicable to a processed contaminated food product in national distribution.

An example of spread of *Salmonella* infections from contaminated egg albumin was reported in England. Widely scattered cases were traced to certain bakeries where dust from American egg-albumin powder contaminated the finished bakery products.

From the above examples it may be seen that foodborne disease-producing micro-organisms are widely distributed in foods in national and international distribution, for which no protection of the public is afforded.

Recent field studies in a metropolitan area have shown *(a)* that *Salmonellae* were present in 17 percent of the raw market poultry and *(b)* that *Staphylococci* were found in 21 percent of the market Cheddar cheese. Direct evidence regarding possible effects of these contaminated foods on the health of consumers is not available, but similarly contaminated products have, on other occasions, been implicated in gastroenteric outbreaks.

The foregoing examples illustrate the complexity and magnitude of the microbiological problems of food protection, which require much increased research efforts by the Public Health Service, in concert with other governmental agencies and industry. Potentially useful approaches to these problems include:

a. Methodological studies to improve techniques for the quantitative detection and identification of pathogenic foodborne micro-organisms and their toxic products.

b. Bacteriological, virological, mycological, and parasitological investigations to determine the kinds, prevalance, persistence, and public health significance of potential pathogens in specific foods. For example, the production of safe shellfish depends on a thorough knowledge of the microbiological condition of estuarial growing areas, as well as commercial harvesting, shucking, and packing operations, which are subject to contamination with various toxic dinoflagellates, enteric bacteria, and viruses.

c. Veterinary public health studies on epizootic diseases of food animals, which may be transmitted to man.

d. Ecological studies on the interrelated physical, chemical, and biological factors that affect the growth and survival of pathogenic micro-organisms in foods.

e. Coordinated epidemiological, clinical, and laboratory investigations of foodborne diseases to establish cause-and-effect relationships, modes of contamination and transmission, extent and severity of illness, techniques for finding and reporting natural outbreaks, and means for prevention and control.

f. Consideration of the public health significance of alterations in the microflora of foods, which may be brought about by the newer methods of processing and marketing; e.g., freeze-drying of products wihch may be reconstituted and sold at delicatessen counters or from vending machines.

g. Field studies in the community setting on practical approaches to the control of microbiological contamination of foods.

FOREIGN CHEMICALS IN FOODS

Increasing contact between foods and foreign chemicals is unavoidable in our technologically oriented economy. Without use of agricultural chemicals, food additives, sanitizing agents, chemically treated water, and synthetic packaging materials,

the United States could not feed the urban population. It has been estimated that elimination of agricultural chemicals alone would reduce farm yields by 10 to 90 percent.

There is also growing concern about the radionuclide contamination of milk and other food by fallout from nuclear explosions, byproducts of atomic reactors, and residues of radioactive wastes. Campbell et al. have estimated that about five-sixths of the strontium 90 taken into the human body comes from foods, especially dairy products. Accidental release of short half-lived radionuclides, such as iodine 131, from a reactor in another country has, on at least one occasion, necessitated withholding milk from the market until the level of radioactivity declined. Extensive studies, in close cooperation with radiological health and atomic energy experts, will be necessary to understand the progression of radionuclides through the food chain and their long-term effects on man.

In a recent address, "Foods, History and Problems," Mrak has noted that "there are no harmless substances; there are only harmless ways of using substances." The determination of how and when chemicals may be used safely in relation to food is already a major public health problem, and it will become even more important in the future.

Some of the avenues by which the health implications of foreign chemicals in foods may be approached are as follows:

a. Methodological studies to develop and simplify analytical procedures for both the presumptive qualitative and quantitative determination of herbicide, insecticide, rodenticide, germicide, and other potentially harmful residues in food. There are many new tools now available which should be studied with respect to their application in this field.

b. Toxicological and pharmacological investigation of animal and human responses to repeated low-level dietary exposures, using chemicals singly or in combinations which are typical of their occurrence in food.

c. Exploration of the correlations between long-term, chronic-toxicity testing and more rapid presumptive procedures, based on reactions of enzyme systems, tissue culture, or micro-organisms, to chemical agents.

d. Radiochemical studies on the occurrence, measurement, intake, retention, and biological effects of radionuclides from foods and other environmental sources, including dietary means of minimizing human exposure and damage.

Nutritional Quality of Market Foods

The newer types of food processing, packaging, and storage provide many opportunities for the addition, removal, modification, and interaction of substances which are physiologically important. For example, high temperatures may destroy heat-labile vitamins and amino acids, and they may also affect the availability of calcium or other mineral components. Efforts to compensate for such losses by supplementation may lead to imbalances and excesses in the total diet. Blending and reprocessing of products may bring about changes of possible health significance which would not otherwise be encountered.

Undigestible materials, such as alginate, pectin, or modified cellulose are often substituted for normal food ingredients in an effort to improve texture and keeping qualities or to lower calorie value and cost. If carried to excess, such modifications may have serious nutritional consequences to certain segments of the population. There are, in fact, hundreds of other artificial substances being used in the manufacture of foods to improve texture, flavor, color, and stability. Apart from their intended uses, these substances have physiological potentials which are, in many instances, incompletely explored at the present time.

In addition to recognizing and avoiding undesirable changes in food, there is the problem of learning how to promote good health by dietary means. The potential for increased resistance to infection, lengthened life, greater vigor, and retardation of degenerative diseases is now recognized, but not enough is yet known in these areas to take advantage of the possibilities in public health practice.

In assessing the physiological significance of the complex changes which occur in foods as they move from farm to factory and thence to the family dinner table, the following approaches may be useful:

a. Comparisons of the dietary effects of different processing methods as applied to a common food, such as raw, pasteurized, evaporated, and dried milk.

b. Assessment of nutritional changes resulting from new processes such as ion-exchange treatment of milk, ultra-high-temperature pasteurization, freeze-drying, dehydro-freezing, microwave cooking, or radiation sterilization.

c. Evaluation of safety with respect to unusual levels and combinations of food ingredients.

d. Biochemical investigation of reactions among food ingredients, with special reference to the formation of compounds which may influence the metabolism of mammals.

e. Controlled long-term studies on animal and human populations to identify and investigate the interrelationships between diet and other environmental factors such as temperature, exercise, radiation, or the pollutants of air and water.

Criteria and Methods of Determining Food Safety

Public confidence in commercially distributed foods depends on the maintenance of high sanitary quality. The buyer, whether he realizes it or not, depends entirely on the industry's awareness of food-hazard problems and the integrity of industrial and governmental controls to insure the safety and wholesomeness of food items purchased in retail markets or public eating places. When these foods are produced and/or processed at locations remote from consumer areas, local health agencies cannot inspect the sanitary conditions to which these prod-

ucts may have been exposed prior to their arrival in the local market. The trend toward centralized manufacturing and widespread distribution of refrigerated, nonsterile, convenience foods has created a need for the development of standard methods and uniform criteria by which the sanitary quality of these products may be determined. Even more, there is vital need to identify the nature and extent of the potential public health hazards.

A substantial beginning has already been made in this area with respect to the interstate shipment of milk and shellfish. The voluntary programs between the States and the Public Health Service in these areas are based on:

1. Employment of sanitation, administration, and evaluation standards recommended by the Public Health Service.
2. Utilization of laboratory methods recommended by the American Public Health Association and the Association of Official Agricultural Chemists.
3. Uniform application of these methods and criteria by the responsible government agencies in both producing and receiving areas; and
4. Self-imposed compliance of the dairy and shellfish industries with the established criteria of sanitary quality.

On the basis of the experience gained in these programs, the Public Health Service is not only in an excellent position to accept leadership in the extension of these concepts to other foods, but must do so at the earliest possible time, since technological progress in the food industries is expanding rapidly. Acceptance of this responsibility will require a continuing effort on each type of food for which the potential public health hazard has been carefully studied, proper practices established, and enforcible sanitary standards adopted. Present knowledge does not permit the use of identical procedures and criteria for different categories of foods. Because of the difficulties in detecting and identifying specific etiological agents, developments of feasible sanitary standards will depend upon the application of indirect tests for indicator organisms and chemicals, which reflect the past history and present quality of the product in question. Activities which will contribute to the development of this area include the following:

a. Study of the microflora, typical of selected foods, and the changes it may undergo during various stages of production, processing, storage, distribution, and preparation for serving.

b. Develop analytical schema for determining chemicals in foods of unknown composition.

c. Develop and evaluate biological, chemical, and physical tests, which may be routinely applied to the examination of foods.

d. Conduct collaborative studies to determine the practical feasibility of selected sampling and analytical procedures.

SURVEILLANCE OF THE CONSUMER FOOD SUPPLY

Development of national leadership in the field of food protection depends heavily on the availability of factual evidence about the sanitary quality of the food supply. Much useful information of this type is obtained regularly by a wide assortment of public and private organizations, but no mechanism presently exists for the collection, processing, and analysis of these data. By developing in the food field a cooperative basis-data program, analogous to the existing air, water, and radiation networks, the Public Health Service can become the focal point of comparative data on the microbiological, chemical, nutritional, toxicological, and related qualities of key food items. Such information will serve to identify potentially hazardous products, provide leads for research, and guide both public and private agencies in planning effective control programs.

Because of the magnitude and complexity of the surveillance program, gradual development over the next 5 years is suggested along the following lines:

a. Establish surveillance programs on milk, shellfish, and the food services of interstate carriers, with which the Service already has much experience and numerous contacts in both control agencies and industry.

b. Determine the variety and utility of information obtainable about additional foods from other sources.

c. Fomulate plans for regular collection and analyses of samples from key stations located in different areas and, if possible, at sites being used by other networks.

d. Devise methods for coding, statistical analysis, and reporting.

e. Develop techniques for utilization of reported findings by industry and government.

EVALUATION OF FOOD EQUIPMENT AND PROCESSES FROM THE PUBLIC HEALTH VIEWPOINT

The design, construction, and operation of milk and food equipment determines, to a large extent, the sanitary condition of finished products. Study of the operational characteristics, reliability of control devices, feasibility of cleaning and sanitizing, resistance to corrosion, and protection against product contamination are essential to the development of sound public health performance criteria.

For competitive reasons, the food-equipment industry cannot assume full responsibility in this area, but it has willingly cooperated with public health agencies to the extent that the latter could specify commercially feasible sanitary requirements. The 3-A Sanitary Standards for dairy equipment represent a notable example of such cooperation.

A substantial increase in public health activity in this area is needed to cope with the wide variety of new equipment being applied to the mechanical processing, packaging, and serving of foods. For example, ultra-high-temperature pasteurization of milk involves complex problems of heat transfer, vapor pressure, fluid flow, and electronic control on which the success and reliability of the process depends. Intimate knowledge of these problems is essential to the definition of the public health require-

ments, and can only be obtained by use of experimental devices and testing of commercial-scale equipment. The service is now constructing temporary facilities in which to conduct engineering and microbiological studies along these lines.

Other important areas in which evaluative studies are needed include:

a. Purification of shellfish taken from substandard growing waters.

b. In-transit food services of airlines, trains, buses, and ships.

c. Automatic vending of meals.

d. Mechanical dish washing.

e. In-place cleaning and sanitizing operations.

f. Freezing, drying, and related processes such as dehydrofreezing, vacuum drying, and multistage evaporation.

g. Cooking and pasteurization processes intended to prolong shelf life, such as heating with infrared or microwaves, high-energy ionizing radiation, or ultraviolet radiation of surfaces.

h. Possible chemical contamination from new types of packaging and equipment materials.

OPERATIONAL TECHNIQUES OF FOOD PROTECTION

The traditional food sanitation programs of health departments already utilize a large segment of the available funds and manpower. Generally speaking, funds have not been appropriated at a rate commensurate with the new responsibilities resulting from advances in food technology, changing eating habits, and population growth. So many new problems have arisen that many departments are no longer capable of providing adequate food protection. There is urgent need to reverse this trend toward obsolescence by the introduction of new administrative and operational techniques which will make more efficient use of the available resources.

In order to guide the State and local agencies in this direction the Public Health Service needs to extend its operations along the following lines:

a. Provide reference laboratory services for the investigation of unusual problems and assessment of routine laboratory performance.

b. Develop recommended ordinances and codes, guides, administrative manuals, and information suitable for distribution to the public.

c. Sponsor field studies and demonstrations to show in practice how new research findings may be applied to local problems.

d. Conduct specialized training courses for the benefit of laboratory, field, and administrative personnel employed by industry and government in the food-protection field, and foster university training programs for professional specialists.

e. Investigate procedures for sharing the responsibility for inspection and laboratory control between government agencies and industry.

f. Promote cooperative research and development projects on food protection problems with the industries involved, utilizing industry facilities whenever feasible.

g. Expansion of program activities related to certification of interstate milk and shellfish shippers, and to the approval of sources of milk. frozen desserts, and perishable foods served on interstate carriers.

IMPLEMENTATION

Substantial expansion of extramural research grants and contracts, as well as intramural research, surveillance, training, and technical assistance activities, is needed to meet the Public Health Service's responsibilities for food protection outlined above. The Milk and Food Program has a nucleus of professional staff around whom these activities can be increased rapidly, but it lacks many of the specific competencies and facilities which will be required for the enlarged program. Its research and training staff are presently composed mainly of bacteriologists, biochemists, and food technologists, about half of whom are housed in temporary laboratories at Cincinnati, Ohio, and Purdy, Wash. The headquarters and regional office staffs are largely sanitary engineers and sanitarians, whose workload is so heavy that a consistent effort cannot be placed on any facet of the technical assistance activities. The program has supplemented its budget with funds from outside sources, such as the Division of Radiological Health and the Army Chemical Corps, in an effort to broaden ist operations. Dependence an such funds tends to create an air of instability, especially in research, which now receives about one-third of its support from outside sources.

Several NIH Study Sections have approved research grants related to food protection, but coverage of the major problem areas is uneven, and the total effort is inadequate to develop the basic information needed by public health agencies. There is no program of institutional grants for research or training purposes specifically associated with food protection.

In the light of the disparity between the existing program and the present-day need for food protection, an order-of-magnitude increase in both intramural and extramural activities seems indicated over the next 5 to 10 years.

INTRAMURAL PROGRAM

The Milk and Food Program is currently limited to milk, shellfish, and food service sanitation. The total resources available for its support in fiscal year 1962 amount to approximately 160 positions and $3 million, of which 45 positions and $1,700,000 are for the establishment of 2 new regional shellfish laboratories. Of the remainder, about 60 positions and $600,000 are allocated for research and training at the Sanitary Engineering Center, while the rest is utilized by headquarters and regional offices for technical assistance and administration.

The two regional shellfish laboratories will partial-

ly fill research needs of long standing. These special-purpose facilities, which must be located in costal areas, are now urgently needed to undertake research on the survival of enteroviruses and other pathogenic agents in estuarine areas and to investigate practical shellfish purification processes. The establishment of these facilities will enable the Public Health Service to meet research needs in the New England, west coast, and gulf areas; however, a need will remain for a similar facility in the important Chesapeake Bay area, and for additional marine laboratories to study the neglected public health problems associated with other seafoods.

The program needs to acquire professional specialists and research facilities with which to activate projects related to all its long-range goals. Technical competence will be required in each area of responsibility in order to utilize the scientific output of the extramural program, provide timely answers to practical problems, and give responsible leadership to cooperative programs. The Supplement to this report, entitled "Areas of Specialization Required To Attain Food Protection Goals," suggests the kinds of professional personnel required and the appropriate depth of competence.

Within the next 5 years, the program should plan to acquire an additional 250 professional staff members, about 500 more supporting personnel, a new central research facility, and an annual operating budget of approximately $8 to $10 million. In the following 5 years, a further threefold expansion is recommended, including the establishment of additional special-purpose regional laboratories.

EXTRAMURAL PROGRAM

In fiscal year 1962 a program of research grants was initiated in the Division of Environmental Engineering and Food Protection. Appropriations in the amount of $3,310,000 are provided for this purpose. Of this amount present obligations for food-related research approximate $2 million. The full amount to be expanded for food research will depend upon approval and priority allocation to applications reviewed at November and March meetings of the National Advisory Health Council.

Contracts are limited to the construction of laboratories and provision of services, such as the collection of specimens for laboratory use. The anticipated cost of these contracts is about $1,800,000 in fiscal year 1962.

Support of professional education in universities is limited to the advanced training of one to two employees annually. Quite obviously, this level of support is inadequate to meet the food-protection problems associated with an $80 billion industry that spends at least 1 percent of its income on research to develop new products, most of which present health agencies with problems of food safety that they are presently unable to consider.

During the next 5 years the Research Grants Program should be expanded both in scope and funds. In addition to the present project grants, provision should be made for more broadly based support to institutions for programs of research, research facilities, and support for large-equipment items which may be used by more than one project or research program. Amounts of money required for this purpose are estimated to require progressive increases in annual amounts ranging from $2 to $5 million during the 5-year period. Comparable increases in contract funds for applied research field studies and surveillance operations will also be needed to support interagency agreements and collaborative studies with industry.

Special effort should be made to initiate, as soon as possible, a program of institutional grants to help train the scientists, engineers, and other professional personnel needed to strengthen food protection throughout the United States. Continuing support of interdepartmental programs in colleges and universities with strong graduate training programs will be necessary. On this basis, it is estimated that the total funds devoted to the extramural program of food protection may reach $15 to $20 million by fiscal year 1967 and should undergo a further threefold or fourfold expansion by fiscal year 1972.

ADMINISTRATION

The Milk and Food Program is included in the newly organized Division of Environmental Engineering and Food Protection. The Committee notes with satisfaction that, in this title, food protection is given divisional recognition for the first time in the Public Health Service. The Division is concentrating its efforts on the several environmental problems typically facing health agencies in large urban areas.

The food supply for metropolitan centers presents an increasing number and variety of public health problems, based on the potential hazards associated with technological changes, the continuing widespread occurrence of foodborne illnesses, rapidly changing economics and pattern of distribution, and the influence foods may have on man's response to environmental stresses. An effective national effort in this area will require an organization that is considerably more complex than the current Milk and Food Program. Inasmuch as food protection is the keystone of environmental health, the organization should be given status and support comparable to that of other major components of this field.

LEGISLATION

Although the Public Health Service Act provides

the basic authority for undertaking a national program of food protection, more specific legislation is needed to delineate Service responsibilities, generate public recognition and awareness, and establish the working relationships with other organizations on which the program depends for its continued development. Federal legislation relating to the certification of interstate milk and shellfish shippers embodying the principles of the present voluntary State-PHS programs, is very much needed. Additional authority should be sought which will make the Public Health Service the focal point of research, surveillance, and standards necessary to maintain and improve the quality of the food supply as it may affect the health and welfare of the consumer. Such legislation should also include provisions for strengthening the extramural program with respect to training, long-term cooperative activities, and categorical research

APHA SUPPORTS NATIONAL MILK SANITATION ACT

The APHA, through action by its Governing Council, has endorsed the passage of H.R. 50 and S. 212, identical bills known as the National Milk Sanitation Act. The Governing Council action was taken on November 2, 1961, favoring "enactment of legislation embodying the principles of the 'National Milk Sanitation Act' which was considered by the 86th Congress of the United States." H.R. 50 and S. 212 (hereinafter referred to as "these bills") are identical to the Act referred to in the above quoted resolution.

The APHA has always supported strong State and local departments and believes that the primary responsibility for the protection of the public's health is legally vested in State and local health departments. These bills state that "—the sanitary control of fluid milk and certain milk products is necessary to protect the public health and recognizes that the exercise of such sanitary control is primarily the responsibility of State and local governments—".

The APHA is opposed, however, to unwarranted use of health regulations as trade barriers. It supports legislation which would eliminate unnecessary and unwarranted sanitation regulations or health laws so long as the rights of States and localities are not abridged. These bills state "— that no State or local government has the right to obstruct the free movement in interstate commerce of milk and milk products of high sanitary quality by use of unnecessary sanitary requirements or other health regulations." However, these bills would protect the rights and privileges of localities to conduct necessary laboratory examinations and inspection procedures so as to protect local consumers from unsafe milk.

Another reason for supporting this legislation is the conviction of the APHA that the safety of milk supply is a public health responsibility, and that authority for assuring a high-quality milk supply should be vested in that agency which is legally responsible for protecting the public's health. In a resolution also adopted, it was resolved by the Governing Council that "the APHA recommends that at all levels of government statutory provisions place in health agencies responsibility for the healthful quality and sanitary control of milk." H.R. 50 and S. 212 would place Federal responsibility and authority for the sanitary control of milk and APHA that this is not only the proper place for this authority but that this action would establish a very significant precedent which might well be emulated by State and local political jurisdictions.

The APHA believes that enactment of this legislation would result in economy in that it would obviate the need for State or local jurisdictions sending inspectors to the source or sources of out-of-State milk supplies. With the requirement for at least 90 percent compliance with a Federal Milk Sanitation Code, receiving jurisdictions would be guaranteed high-quality milk. The APHA further believes that the certification by States, based upon a nationwide standard, is a laudable example of Federal, State, and local cooperation which merits endorsement and support.

FOOD ADDITIVES MANUAL AVAILABLE

Guidelines for dealing with the statutes which affect food manufacturers, processors and others will be found in a newly issued section of the Food Additives Manual of the Manufacturing Chemists' Association, Inc.

The 18-page booklet consists of three parts and covers (1) Federal Laws Under Which Control is Exercised Over Foods Entering Into Interstate Commerce, (2) The Federal Food, Drug, and Cosmetic Act, and (3) Amendments to the Federal Food, Drug, and Cosmetic Act.

According to Kenneth E. Mulford, chairman of the MCA's Food Additives Committee, which supervised preparation of the booklet, it should prove extremely helpful for information on the principal features of the law.

"It also will be particularly helpful to those having dealings with the Food and Drug Administration," Mulford pointed out.

In part three of the booklet, the Food Additives Amendment of September, 1958 and the Color Additive Amendment of 1960 are described at some

length. Definitions which are involved in this special area of law are highlighted and such matters as what the amendments prohibit, authorize, require, or prescribe as well as other areas are covered.

The new booklet is a sequel to a previously issued section of the manual entitled "How to Proceed Under the Food Additives Amendment." James M. Gillet, retired former chairman of the MCA Committee, served in a consulting capacity in the preparation of both booklets. Additional sections of the manual are planned in the future.

Copies of the newly issued booklet are available from the Association at 75 cents each. The address: 1825 Connecticut Avenue, N. W., Washington 9, D. C.

LETTER TO EDITOR*

Dear Mr. Thomasson:

Will you please accept my resignation as a member of the organization?

It has been a privilege and honor to be a member, for which I thank you.

I am in my eighty-sixth year and have been retired for almost twenty years, after forty years of service in Dairy and Food Sanitary Inspection, representing the New York State and City of Syracuse Health Departments.

Kindly extend to the other members of the staff my many thanks and appreciation for the good work and service you are giving to the members and experts in preventive medicine.

Sincerely Yours,
George E. Hannett

***The Association is honored to receive Mr. Hannett's letter. It is a compliment to our Association to know that a member who retired nearly twenty years ago, has maintained his membership all these years. We extend best wishes to Mr. Hannett and thank him sincerely for his loyalty.**

SANITARIANS REGISTRATION ACT PASSED BY SOUTH CAROLINA

The General Assembly of South Carolina passed an Act in March 1962 creating a Board of Examiners for Registered Sanitarians and setting forth procedures whereby persons could be qualified and registered in this profession.

South Carolina thus, has become the nineteenth state to enact such legislation.

In a letter from the Chairman of the Registration Committee, C. W. Harrell, he indicated that it was only through the interest, effort and cooperation of every member of the South Carolina Association, that this law was passed.

An unanticipated last minute change, involving qualifications, proposed by a member of the General Assembly detracted from the original and full intent of the Act. However, at this point the Association decided further delay would endanger hope of passage so the Act was permitted to proceed even though not wholly in accord with the Association's original plan.

The South Carolina Association is to be congratulated for this progressive step. *International* is pleased to note that another affiliate has carried to completion a program that will enhance recognition and the professional qualifications of the Sanitarian.

FAULKNER TAKES NEW POST OTHER CHANGES MADE

Three changes in personnel were announced today by the Public Health Service.

John D. Faulkner was named Associate Regional Director for Environmental Health at Charlottesville, Va., effective may 15, succeeding Callis H. Atkins, now Chief Engineering Officer of the Service. Mr. Faulkner, who was formerly a senior sanitary engineer with the North Carolina Board of Health and later chief of the Engineering Section of the Institute of Inter-American Affairs, was commissioned in the Public Health Service in 1949. For the past 8 years he has been chief of the Milk, Food and Shellfish Program. In his new assignment he will be responsible for general direction and coordination of PHS environmental health activities in Maryland, Virginia, West Virginia, the District of Columbia, the Virgin Islands and Puerto Rico.

Edwin L. Ruppert, a sanitary engineer with the Public Health Service since 1941 and assistant chief of the Milk and Food Program for the past two years will succeed to Mr. Faulkner's old post.

Eugene Jensen, a PHS sanitary engineer since 1949 was named chief of the newly established Shellfish Sanitation Branch. He previously headed the unit when it was part of the Milk and Food Program.

John D. Faulkner who is a native of New Bern, North Carolina, reported for active duty in the Public Health Service Commissioned Corps in 1949. Since 1954 he has been chief of the Milk and Food program of the Service.

A graduate of North Carolina State College of the University of North Carolina in Mechanical Engineering, Mr. Faulkner received his Master of Science degree in Public Health Engineering from the University of Michigan. Before joining the Public Health Service, he worked from 1935 to 1941 as a sanitary engineer with the North Carolina State Board of Health. During World War II he rose from First Lieutenant to Lieutenant Colonel in the U. S. Army, and served overseas as a staff officer at Supreme Headquarters, Allied Expeditionary Forces, European Theatre of Operations. He was decorated several times for his work in the movement of displaced persons from the zone of military operations.

After World War II and prior to his joining the Service,

he was from 1946 to 1947 Chief Engineer and Associate Chief of Brazilian Field Party, Institute of Inter-American Affairs in Rio de Janeiro. From 1947 to 1949 he was chief of the Engineering Section, Division of Health and Sanitation, Institute of Inter-American Affairs, Washington, D. C. He is married to the former Margaret Young of Raleigh, North Carolina.

Edwin L. Ruppert is a native of Washington, D. C. He was graduated from the University of Maryland with the B. S. degree in Civil Engineering in 1936 and the M. S. degree in Sanitary Engineering at Johns Hopkins University in 1950. He served with the Public Health Service from 1941 to 1945. From 1945 to 1957 he was head of Environmental Sanitation for the Washington State Department of Health. He rejoined the Service in 1957 and served since 1959 as assistant chief of the Milk and Food Branch.

Eugene Jensen, a native of Woodstock, Illinois, was graduated from the Colorado State University, Civil Engineering School, with a B. S. degree in 1949 and from the University of Michigan School of Public Health with a Master of Public Health degree in 1960. During World War II he was a pilot with the 8th Air Force. He served for a brief time after graduating from college in Colorado as a sanitary engineer with a district health department. He has been with the Public Health Service since 1949 and has been acting chief or chief of Shellfish Sanitation since 1955. He is married to the former Myrl Halstead of Glenwood, Minn. The couple live in Bethesda, Maryland.

PAPERS PRESENTED AT AFFILIATE ASSOCIATION MEETINGS

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

INDIANA ASSOCIATION OF SANITARIANS

Twelfth Annual Meeting
Rice Auditorium — Indiana State Board of Health
Indianapolis, Indiana
June 12, 13, 14, 1962
(*Secretary*: Karl K. Jones, 2645 West 22nd St., Indianapolis 22, Ind.)

COMMITTEE REPORTS

Report of Membership Committee - Frank W. Mackison.
Report of Association Certification Board - Chris Schrock.
Report of 3-A Sanitary Procedures Committee - J. W. Nix.
Report of Sanitation Education Committee - John D. Boruff.

GENERAL SANITATION

Public Health Aspects of Housing - Henry G. Nester, M. D., Dir., Div. of Public Health, Health & Hospital Corp. of Marion County.
Current Trends in Pest Control - H. D. Pratt, Phd., Chief, Insect and Rodent Control, U.S.P.H.S., Communicable Disease Center.
Small Sewage Treatment Plants - A. L. Klatte, Dir., Bureau of Environmental Sanitation, Div. of Public Health, Health & Hospital Corp. of Marion County.

MILK SANITATION

Economic Trends in the Dairy Industry - Charles E. French, Ph.D., Ass't. Head, Dept. of Agricultural Economics, Purdue University.
HTST Pasteurizer Installations - W. R. McLean, Assoc. Program Dir., Division of Environmental Engineering and Food Protection, U. S. P. H. S.
Ice Milk Frozen Dessert Standards - James R. Harton, Chief, Manufactured Milk Section, Div. of Dairy Products, Indiana State Board of Health.

FOOD SANITATION

Changing Concepts of Sanitation in Food Processing - Merle M. Ording, Regional Supervisor, Klenzade Products Co.
Black, White and Gray - Warren R. Spangle, Exec. Vice-Pres., Indiana Restaurant Ass'n.
Detecting Chemical Residues in Food - George Schwartzman, Chief Chemist, Cincinnati District, U. S. Food & Drug Administration.

GENERAL SESSION

Sanitarian in Court - Judge Marshall Williams, Maywood Magistrate Court of Marion County; Howard L. Whitecotton, Deputy Prosecutor of Marion County.
Your International Association of Sanitarians - H. L. Thomasson, Exec.-Sec., IAMFS, Inc.
Report of Committee on Education and Professional Development - H. S. Adams, Assoc. Professor of Public Health, Indiana University School of Medicine.

WYOMING-COLORADO DAIRY INDUSTRIES and MILK AND FOOD SANITARIANS CONFERENCES

The University of Wyoming
Laramie, Wyoming
June 7-9, 1962

(*Secretary of Rocky Mountain Ass'n.*: Frank Yatckoske, 3150 W. 25th Ave., Denver 11, Colo.)

What's Ahead for the Dairy Industry? - D. V. Josephson, Ph.D., Head, Dept. of Dairy Science, Penn State Univ., University Park.
The Story Behind Detection of Radioactive Substances in Milk and Other Foods - R. L. Sundin, Wyoming Dept. of Public Health, Cheyenne.
Aspects of Vitamin and Mineral Fortification of Milk - F. M. Aldridge, Jr., Sales Mgr., Vitex Laboratories, Newark, N. J.
Uniform Labeling of Dairy Products - Harold Barnum, Exec. Sec., Dairy Products Improvement Institute, Ithaca, N. Y.
Evaluation of Cottage Cheese Manufacturing Methods - Don Eakle, Dir., Culture Dept., Chr. Hansen's Lab., Inc., Milwaukee, Wisc.
What's New in Single Service Containers? - W. V. Hickey, Environmental Health Consultant, Public Health Committee, Paper Cup and Container Institute, New York, N. Y.
The Poly Pure-Pak Story - Charles Purrett, Marketing Div. and Dwight Striplin, Research Div., Fibreboard Paper Products Corp., San Francisco, Calif.
Along the Milky Way - Loren Gafke, Regional Dir., American Dairy Ass'n., Columbia, Mo.
A Bulk Tank Hauler's Training Program - E. O. Wright, Ext. Dairyman (Mfg.), Iowa State Univ., Ames.
Significance of Flavor in Dairy Foods - D. V. Josephson.
Culture Care and Phage Control - Don Eakle.
Sanitizers, Their Use and Abuse - C. A. Abele, Ph. D., Public Health Research, The Diversey Corp., Chicago, Ill.
The Colorado-Wyoming Mastitis Detection and Conrtol Program - Irv Slater, Dairy Extensionist, University of Wyoming, Larmie.
Public Health Aspects of Mastitis - C. E. Sevy, D.V.M., Staff Veterinarian, Div. of Environmental Engineering and Food

Protection, Dept. Health, Education & Welfare, Washington, D. C.

A Quality Milk Program After Mastitis - E. O. Wright.

A Progress Report, National Mastitis Program - G. W. Willits, Exec. Sec., National Mastitis Council, Inc., Hinsdale, Ill.

Who Has Problems? - S. M. Morrison, Ph.D., Dept of Pathology and Microbiology, Colorado State Univ., Ft. Collins.

ASSOCIATED ILLINOIS MILK SANITARIANS

20th Annual Spring Conference
McCormick Place, Chicago, Ill.
May 7, 1962
(*Secretary*: James A. Meany, 8948 South Laflin St., Chicago 20, Ill.)

Public Health Aspects of Food Vending - Harold Wainess, Harold Wainess & Associates.

The Disease Cycle From Cow to Man - Carl Branley, DVM, College of Veterinary Medicine, University of Illinois.

Future of the Dairy Industry - William Eckles, Pure Milk Products, Fond du Lac, Wisc.

Radioactive Fallout - The Dairy Cow and Her Milk - John Rust, Head, Nuclear Medicine Section, University of Chicago.

DR. WARREN LITSKY APPOINTED MICROBIOLOGY INSTITUTE HEAD

Dr. Warren Litsky, Commonwealth professor of microbiology in the Agricultural Experiment Station at the University of Massachusetts, has been appointed director of the new Institute of Agricultural and Industrial Microbiology established here last month.

Establishment of the Institute was due primarily to the national recognition of Dr. Litsky's research in bacteriology and public health, says Pres. John W. Lederle in announcing the latter's appointment by the board of trustees.

He is currently conducting research to obtain scientific data to assist in the production of high quality precooked frozen foods through development of standard methods of testing, under a three-year U.S. Public Health Service grant.

One of the younger and more outstanding scientists at the university, Dr. Litsky is a recipient of the Distinguished Service Award from the U.S. Junior Chamber of Commerce and the Sayer Award in Bacteriology. He is a fellow in Great Britain's Royal Society of Health and the American Public Health Association, and is listed in *Who's Who in the East* and *American Men of Science.*

At present, Dr. Litsky serves as a special consultant to the water supply and pollution control program of the U.S. Public Health Service.

A native of FITCHBURG, Dr. Litsky received his B.S. from Clark University, his M.S. from the University of Massachusetts and his doctorate from Michigan State University. He is the author of more than 70 scientific articles.

FDA CURBS FOOD QUACKERY

One of the country's leading sources of nutritional quackery has been curbed by Federal Court action, the Food and Drug Administration announced today.

FDA said that sentencing of Royal Lee, president of the Vitamin Products Co., Milwaukee, Wis., will stop distribution of over 115 special dietary products promoted by false claims for treating more than 500 different diseases and conditions.

Federal Judge Robert Tehan sentenced Lee to a one-year suspended prison term with three years probation and fined the Vitamin Products Co. $7,000 on charges of interstate shipment of misbranded vitamins and proprietary remedies. Lee also consented to a permanent injunction covering all of his enterprises which prohibits the false claims for his products.

Lee's products and quack literature have been widely distributed through health practitioners, FDA said. The claims covered the gamut of human diseases and symptoms from acne and arteriosclerosis to cancer, cataracts, cirrhosis of the liver and virus infections.

FDA said the injunction also stops Lee from claiming the products are necessary adjuncts to the diet. Some of the claims banned by the Court include, "All disease conditions are the result of malnutrition," "Some 700,000 people a year die of preventable and curable heart disease caused by deficiency of natural vitamins" and "Arthritis and tooth decay are caused by the eating of cooked foods."

The Lee enterprises enjoined by the Court included the Vitamin Products Co., Lee Foundation for Nutritional Research, Endocardiograph, Inc., and Leeland, Inc.

Lee holds a degree in dentistry, FDA said, but he has not been known to practice that profession. Instead he became one of the country's leading health faddists and a regular speaker on the subject. His "health food" business is estimated at some $3,000,000 a year.

Through nation-wide distribution of leaflets and other literature by his Lee Foundation for Nutritional Research, Lee has incessantly attacked such well recognized public health measures as water fluoridation, milk pasteurization and vaccinations.

Lee was first prosecuted by FDA in December, 1934, for misbranding one of the same products involved in the current action. A jury found him guilty in a verdict sustained by a Court of Appeals.

The Federal Trade Commission entered an order against him in February, 1945, that he stop disseminating advertising that certain of his products are useful nutritional treatments for diseases. The U. S. Post Office proceeded against the Lee Foundation for Nutritional Research in 1956, charging it

was receiving money through the mails as a result of false and fradulent misrepresentations for a book titled "Diet Prevents Polio." The Foundation executed an affidavit of agreement discontinuing these representations.

NEW PHS FOOD CODE ISSUED

A new edition of the *Ordinance and Code Regulating Eating and Drinking Establishments* became available on May 18, 1962. The new publication is entitled, *Food Service Sanitation Manual,* 1962. It is PHS publication, Number 934.

The new publication is a culmination of work carried on through joint action of the Milk and Food Branch, PHS and a sixteen member advisory committee, appointed by the Surgeon General. Preliminary work toward revision of the 1943 edition of the Ordinance and Code was started late in 1957.

At the outset of committee deliberations it was quite apparent that many changes and advances had taken place in the food service industry since the last edition was published in 1943. It was further evident that the coverage and format of the earlier edition should be changed and expanded.

In the new edition one will find a number of significant changes. Included in the new document are two sections, as Part I and II, the former covering *Need, Purpose and Scope of a Food Service Program,* and in the latter, *Conducting An Effective Food Sanitation Program.* These two sections present convincing evidence that food sold through public restaurants and similar outlets is a public health responsibility of no small proportion and that communities should recognize the problem of control and carry on effective programs.

There are many other changes and upward revisions in the new Manual. Among the more noteworthy is the prominent place given to food itself. In the ordinance and code a section on *Food Supplies* follows immediately after *Definitions.* This is tangible recognition that physical facilities such as walls, floors, etc., though needing attention, do not merit as prominent a position in food service control as does the food itself. The new document highlights food and gives it a place which should demand more careful and critical attention on the part of public health authorities.

Following *Food,* comes the section on *Personnel.* The health status of the food worker has been expanded mentioning such clinical signs as boils, skin conditions and acute respiratory infections. This section is now more clear cut, pin pointing conditions of personnel health which may be potentially dangerous to food and to customers.

Personal cleanliness likewise has been given more precise definition. Hand cleanliness of course is emphasized but the mandatory posting of hand washing signs has been deleted. However, head coverings, or hair nets are required.

In regard to the construction of food equipment, no attempt has been made to present detailed specifications as contained in recommended standards promulgated by a number of health-industry groups. However, the *Manual* does recommend that applicable published standards be followed by local jurisdictions using the *Manual.*

Some change has been made in the section dealing with washing and sanitizing of tableware and dishes. When hot water sanitization is used a temperature of 170° F, with a immersion period of at least one-half minute is required; with chlorine used as the sanitizing agent, not less than 50 ppm is specified in water at a temperature of not less than 75°F and an exposure period of at least one minute. In the case of iodine bearing agents, at least 12.5 ppm at a pH not higher than 5.0 in water not below 75°F and a minimum exposure of one minute is specified.

In the case of spray type dishwashing machines, flow pressure in the hot waterline serving the machine shall be not less than 15 nor more than 25 pounds per square inch. In this connection it is required that a gauge cock be installed in the line immediately upstream from the final rinse spray to permit checking of the line pressure.

Perhaps one of the most radical changes incorporated in the new *Manual* has to do with enforcement provisions. To those accustomed to the inspection form used with the 1943 edition, the new form presents rather noteworthy innovations. First, inspections will now be based on a numerical system which in turn utilizes a demerit system. The largest value assigned any item is six points. The lowest value is one point. In using this new system, the following instructions are given:

a. When the demerit score of the establishment is 20 or less, all violations of 2 or 4 demerit points must be corrected by the time of the next routing inspection; or
b. When the demerit score of the establishment is more than 20 but not more than 40, all items of 2 or 4 demerit points must be corrected within a period of time not to exceed 30 days; or
c. When one or more 6 demerit point items are in violation, regardless of demerit score, such items must be corrected within a period of time not to exceed 10 days.

For those health authorities wishing to use a grading system, this may be done but the system of determining the grade (A, B, or C) is likewise on a numerical (demerit) basis.

For an establishment to earn a Grade A designation, the demerit score shall not exceed 10; Grade B more than 10, but not more than 20; Grade C more than 20 but not more than 40.

It is believed the new system of enforcement, giving a numerical value to each item, plus demerits for violations, will demand a much more thorough inspection of all food service methods and facilities and will point out the urgency of correcting defects which carry four and six point values. In addition, the food service operator should be made more cognizant of those items of greatest public health significance when he becomes acquainted with the new enforcement system.

While the trained and experienced food sanitarian will have no particular difficulty in using the new system, in all cases it should result in more definitive inspection results and more concise recommendations to the food service industry.

As is the case with any new departure from a former program, food sanitarians will need to study the new document very thoroughly. In addition, the Regional Office personnel of the Public Health Service, will undoubtedly conduct orientation and in-service type conference where local food control personnel will be briefed in the new system of numerical rating.

NEW GENERAL MANAGER APPOINTED FOR KLENZADE

S. K. Mahood new General Manager of Klenzade Division.

Officials of the Klenzade Products Division, Economics Laboratory, Inc., Beloit, Wisconsin, have announced the appointment of Mr. S. K. Mahood to the position of General Manager.

Mr. Mahood will immediately assume his new duties directing the activities of Klenzade's research, manufacturing and sales departments. Mr. A. L. Shogren and Mr. C. B. Shogren, Vice Presidents of the Klenzade Products Division, will continue in senior advisory capacities and assist Mr. Mahood in the development of his duties.

A native of Canada, Mr. Mahood has been a leader in the dairy equipment industry for over 30 years, starting as a sales representative with International Harvester Company and rising to the position of President and General Manager of DeLaval Company, Ltd., Peterborough, Ontario, the Canadian distributors of Klenzade Sanitation Products. He played an important part in the development of today's modern milking and dairy processing equipment which has helped to give the consumer clean, quality dairy products. It is in this vital area that Mr. Mahood brings a wealth of experience in dairy sanitation to Klenzade Products.

The Klenzade Products Division manufactures and merchandises a complete line of sanitation chemicals and equipment for the dairy and food industries. These industries are served by 150 Klenzade technical representatives in the United States and branch offices in Canada, Puerto Rico, Mexico, and Italy.

QUESTIONS AND ANSWERS

Note: Questions of technical nature may be submitted to the Editorial Office of the Journal. A Question in your mind may be in the minds of many others. Send in your questions and we will attempt to answer them.

QUESTION:

What is meant by reactivated phosphatase and what is the basis of the test for differentiating between residual and reactivatable phosphatase?

ANSWER:

Inactive phosphatase may be found in dairy products that have been adequately pasteurized by HTST or UHT methods. It can be activated (J. Assoc. Offic. Agr. Chem. **43**:414. 1960) by holding the milk or cream at a temperature above 50° F any time following pasteurization. This reactivated phosphatase will give a positive test when examined by conventional phosphatase methods; hence, the need for a test to differentiate it from residual phosphatase which is indicative of inadequate pasteurization. The test for differentiating between residual and reactivated phosphatase (J. Assoc. Offic. Agr. Chem. **44**:444.1961) is based upon the fact that, when, a soluble magnesium salt is added to the product containing reactivatable phosphatase, the activity is increased ten to fifteen fold over the activity of the product containing no magnesium, when both are incubated for 1 hr. at 34° C. Under similar conditions, residual phosphatase does not show any such increase in activity.

QUESTION:

Is the test for differentiating reactivatable from residual phosphatase in HTST or UHT pasteurized milk or cream applicable to aged products?

ANSWER:

If the product containing inactive phosphatase has been

stored continuously after pasteurization at a temperature below 50°F, it will give a negative phosphatase test even after holding for two weeks. On the other hand, if the temperature of the product has been allowed to rise to 50°F or above, the phosphatase may be reactivated gradually and will then give a positive test. In either case, the differential test may be applied, and it will distinguish between residual and reactivatable phosphatase in the stored product, provided the temperature has *not* been above 50°F long enough to permit *complete reactivation;* e.g., 70°F for 2 to 3 hours, or a day or two at a somewhat lower temperature. Under the latter conditions, the differential test is not applicable because reactivation will already have progressed to such an extent that the addition of a soluble magnesium salt no longer produces a significant increase in activity. This limitation of the differential test is not particularly objectionable from the standpoint of quality control or public health, because storage of non-sterile fluid milk products at elevated temperatures (above 50°F), for even short periods, is an unsound practice.

QUESTION:

Is the test for differentiating reactivatable from residual phosphatase applicable to sterile products?

ANSWER:

Sterile milk or cream may contain reactivatable or reactivated phosphatase. However, the differential test will not be applicable to sterile products unless they have been continuously refrigerated. Since refrigeration of sterile products is not necessary, the inapplicability of the differential test is of little consequence from the public health viewpoint.

QUESTION:

What tests may be used to detect inhibitory substances in water used to make bacteriological media and dilution blanks?

ANSWER:

Standard Methods for the Examination of Dairy Products, 11th ed. Am. Pub. Health Assoc., describes two tests. One is a screening test for dilution-water toxicity which depends on repetitive plating from buffered dilutions of milk samples at intervals of 10, 20, 30 and 45 minutes. Toxicity is indicated by a trend toward lower bacterial counts within the 45-minute holding period.

A second test for the suitability of distilled water is based on recent work done at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, by members of the microbiology staff of the PHS Division of Water Supply and Pollution Control. In this method an active pure culture of *Aerobacter aerogenes* (IMViC −−++) is inoculated into portions of a redistilled water control and the water being tested, both with and without added nutrients and salts. Plate counts are made from each portion after incubation for 24 hours at 32° or 35°C. Computation of plate count ratios permits detection of both inhibitory and growth promoting substances. Ratios of 0.8 to 1.2 (inclusive) indicate that the water is satisfactory for bacteriological use. Ratios less than 0.8 indicate the presence of inhibitors and those greater than 1.2 indicate growth promoting substances. This test is also applicable to undistilled water supplies or stream samples and is included in *APHA Standard Methods for Water and Wastewater.*

The suitability test for distilled water is more sensitive and reproducible than the screening test for dilution water. Surveys made with the suitability test indicate that 10 to 20 per cent of the laboratory sources of distilled water contain inhibitors in some parts of the country. In comparative examination of split milk samples, laboratories using toxic distilled water have reported significantly lower plate counts than laboratories using acceptable distilled water.

CALENDAR OF MEETINGS

1962

July 12-13—Pennsylvania Dairy Fieldmen's Conference, Annual Meeting, Pennsylvania State University, University Park, Pa. Administrative Officer, Dr. F. J. Doan, Pennsylvania State Univ., University Park, Pa.

July 19—Indiana Dairy Products Ass'n., Summer Outing, Anderson Country Club, Anderson, Ind. Administrative Officer, Ward K. Holm, 603 Union Title Bldg., Indianapolis, Ind.

August 5-8—West Virginia Dairy Products Association, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, West Virginia. Administrative Officer, S. J. Weese, West Va. University Dairy, Morgantown, W. Va.

August 10-25—School and Community Health Workshop, Indiana Univ., Bloomington, Ind.

Sept. 3-7—XVI International Dairy Congress, Copenhagen, Denmark.

Sept. 5-7—Iowa Milk and Ice Cream Mfgrs., Associations, Workshop Outing, The New Inn, Lake Okoboji, Iowa. Administrative Officer, John H. Brockway, 710 Fifth Ave., Des Moines, Iowa.

Sept. 10-12—Association of Ice Cream Mfgrs. of New York State, Annual Meeting, Whiteface Inn, Whiteface, N. Y. Administrative Officer, Peter F. Rossi, 405 Lexington Ave., New York 17, N. Y.

Sept. 11-13—University of Minnesota, Dept. of Dairy Industries, Dairy Products Institute Meeting, Dairy Industries Bldg., St. Paul Minnesota. Administrative Officer, S. T. Coulter, Head, Dept. of Dairy Industries, University of Minnesota, St. Paul 1, Minn.

Sept. 12-13—National Dairy Council Board of Directors Meeting, Sheraton-Chicago Hotel, Chicago, Illinois. Administrative Officer, Milton Hult, 111 North Canal Street, Chicago 6, Illinois.

Sept. 17—Wisconsin Creameries Association, Annual Convention, Whiting Hotel, Stevens Point, Wisconsin. Administrative Officer, Oscar Christianson, 1 West Main Street, Madison, Wisconsin.

Sept. 18-20—American Dairy Association Board of Directors & State Managers Meeting, Olympic Hotel, Seattle, Washington. Administrative Officer. M. J. Framberger, 20 N. Wacker Drive, Chicago, Illinois.

Sept. 19-21—National Ass'n. of Dairy Equip. Mfgrs., Members only, Lake Lawn Lodge, Delavan, Wisc. Administrative Officer, John Marshall, 1012 14th St., N. W., Washington, D. C.

Sept. 24—Dairy Mixers, Inc., of Philadelphia, Annual Outing, Aronimink Country Club, Philadelphia, Pa. Administrative Officer, Ernst J. C. Fischer, 2809 W. Queen Lane, Philadelphia 29, Pa.

Sept. 24-26—American Dairy Association, Board of Directors & State Managers Meeting, Olympic Hotel, Seattle, Washington. Administrative Officer, M. J. Framberger, 20 N. Wacker Drive, Chicago 6, Ill.

September 24-26—National Dairy Council of Canada, Annual Convention, Empress Hotel, Victoria, B. C. Administrative Officer, W. K. St. John, Journal Bldg., Ottawa, Canada.

Sept. 27—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago 1, Illinois.

Oct. 2-3—Minnesota Creamery Operators' and Managers' Association, Annual Convention and Business Sessions, Hotel Lowry, St. Paul, Minnesota. Administrative Officer, Floyd Thompson, 416 New York Building, St. Paul 1, Minnesota.

October 8-12—12th Annual Instrument Symposium and Research Equipment Exhibit, National Institutes of Health, Bethesda 14, Maryland. Administrative Officer, James B. Davis, National Institutes of Health, Bethesda 14, Maryland.

Oct. 9-10—ADA of North Dakota and North Dakota Dairy Industries Ass'n., Joint Annual Meeting, Gardner Hotel, Fargo, N. D. Administrative Officer, Vernon L. Pepple, 819 Avenue B. West, Bismarck, N. D.

Oct. 10-11—Vermont Dairy Industry Association, Annual Meeting and Educational Conference, University of Vermont, Burlington, Vt. Administrative Officer, Henry V. Atherton, Dairy Bldg., Burlington, Vt.

Oct. 10-11—Washington State Dairy Foundation, Statewide Convention, Chinook Hotel, Yakima, Wash. Administrative Officer, Robert J. Keyser, 550 Skinner Bldg., Seattle 1, Wash.

Oct. 13-16—National Automatic Merchandising Association, Brooks Hall, San Francisco, Calif.

Oct. 19-20—Iowa Creameries Association, Iowa Milk Producers Federation, Iowa Milk Driers Ass'n., State Convention, Hotel Roosevelt, Cedar Rapids, Iowa. Administrative Officer, Arthur Kirchhoff, P. O. Box 377, Ames, Iowa.

Oct. 21-24—National Association of Food Chains, Annual Convention, Denver Hilton & Brown Palace Hotels, Denver, Colo. Administrative Officer, Clarence Adamy, 1725 Eye Street, N. W., Washington 6, D. C.

Oct. 24-27—International Association of Milk and Food Sanitarians, Inc. Annual Meeting, Ben Franklin Hotel, Philadelphia, Pennsylvania. Administrative Officer, H. L. Thomasson, P. O. Box 437, Shelbyville, Indiana.

Oct. 28-Nov. 2—Dairy Exposition, Atlantic City, New Jersey. Administrative Officer, Joseph Cunningham, Dairy Industry Supply Association, 1145 - 19th St. N. W., Washington, D. C.

Oct. 29-31—National Association of Retail Ice Cream Mfgrs., Inc., Annual National Convention, Hotel Haddon Hall, Atlantic City, N. J. Administrative Officer, E. M. Warder, 2223 Detroit Ave., Toledo 6, Ohio.

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

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

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

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

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

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

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

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

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

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

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

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

Dec. 13—Evaporated Milk Ass'n., Industry Meeting, Sherman House, Chicago, Ill. Administrative Officer, E. H. Parfitt, 228 N. LaSalle St., Chicago 1, Ill.

PATTERSON GETS AGRICULTURE POST IN DAIRY SECTION

Francis Patterson has been named head of the dairy division of the Agriculture Department to succeed C. W. Pegram, who is retiring June 30.

The announcement was made this morning at a meeting of the State Board of Agriculture.

For Patterson, the move is a promotion. He has been assistant head of the division for the past seven years.

Pegram will be leaving after 25 years as head of the division which administers laws and regulations governing minimum standards for milk and dairy products.

Agriculture Commissioner L. Y. Ballentine said he regrets to see Pegram leave but "we are indeed fortunate in that we have in Mr. Patterson a man who is well equipped and equally conscientious, and who has had 15 years of on-the-job experience."

Patterson is a native of Cumberland County and a graduate of the School of Public Health at the University of North Carolina.

He served for 17 years as milk sanitarian with the City of Rocky Mount Health Department and later worked with Southern Dairies in Atlanta, Ga., before coming to the Agriculture Department as a dairy inspector in 1947.

Pegram came to work in the dairy division in 1937. He is a graduate of State College and holds a masters degree from that institution.

He is co-author of a book, "Dairy Farming in the South."

Mr. Patterson and Mr. Pegram are long time members of International Association of Milk and Food Sanitarians, Inc.

INDEX TO ADVERTISERS

DR. JOHN M. JACKSON ASSUMES I.F.T. PRESIDENCY

Dr. John M. Jackson of the American Can Company, Barrington, Illinois, assumed the presidency of the Institute of Food Technologists in a brief ceremony at the Hotel Fontainebleau, Miami Beach, Florida.

He had been named president-elect of that professional society last year and today received the gavel of office from his predecessor, Dr. Harold W. Schultz, head of the department of food science and technology at Oregon State University.

Dr. Jackson graduated from the University of Chicago in 1929 and received his Ph. D. in chemistry from that institution in 1932. He joined his present employer at that time and is currently manager of the company's special investigations section of the research division.

A specialist on thermal processing of canned foods with emphasis on high-temperature short-time processing and aseptic canning, Dr. Jackson has also worked on the development of frozen food and pressurized products packaging.

Prominent in the activities of the Institute since 1939, Dr. Jackson has also held positions of responsibility in the Research and Development Associates of the Quartermaster Food and Container Institute for the Armed Forces and is also president of that non-profit group. He has served on the National Research Council's committee on radiation preservation of foods and has been prominent in various technical activities of the National Canners Association.

Dr. Jackson is a member of the American Chemical Society, Sigma Xi and Phi Tau Sigma.

NATIONAL MEDICAL AUDIOVISUAL FACILITY

A central audiovisual function has been established for the U. S. Public Health Service at its Communicable Disease Center in Atlanta.

Formerly the Audiovisual Section, the newly designated National Medical Audiovisual Facility will have responsibility for 1) development, production, acquisition, distribution, and utilization of medical motion pictures and other audiovisual forms; 2) maintenance of the National Medical Motion Picture Archives; 3) dissemination and exchange of scientific and other medical film information important to progress in medicine and public health; 4) encouraging the development and production of medical films and other audiovisuals; and 5) stimulating a speed-up in the circulation of medical knowledge, on a national and international basis, through audiovisuals.

Concerning the role of the newly designated facility, Dr. James Lieberman, director, said, "Communications problems in the life sciences can be met realistically through maximum use of existing national resources. This facility will join with public and private groups in all parts of the national to help

effect audiovisual communications among members of the medical and scientific communities and between these groups and the general public."

Dr. Lieberman emphasized that internationally, as in the past, the facility will give assistance within the limits of its resources. Films will continue to be sent in small numbers to foreign countries where customs regulations do not prohibit shipment. Recently, a study of the international exchange of medical motion pictures was undertaken by the Communicable Disease Center.

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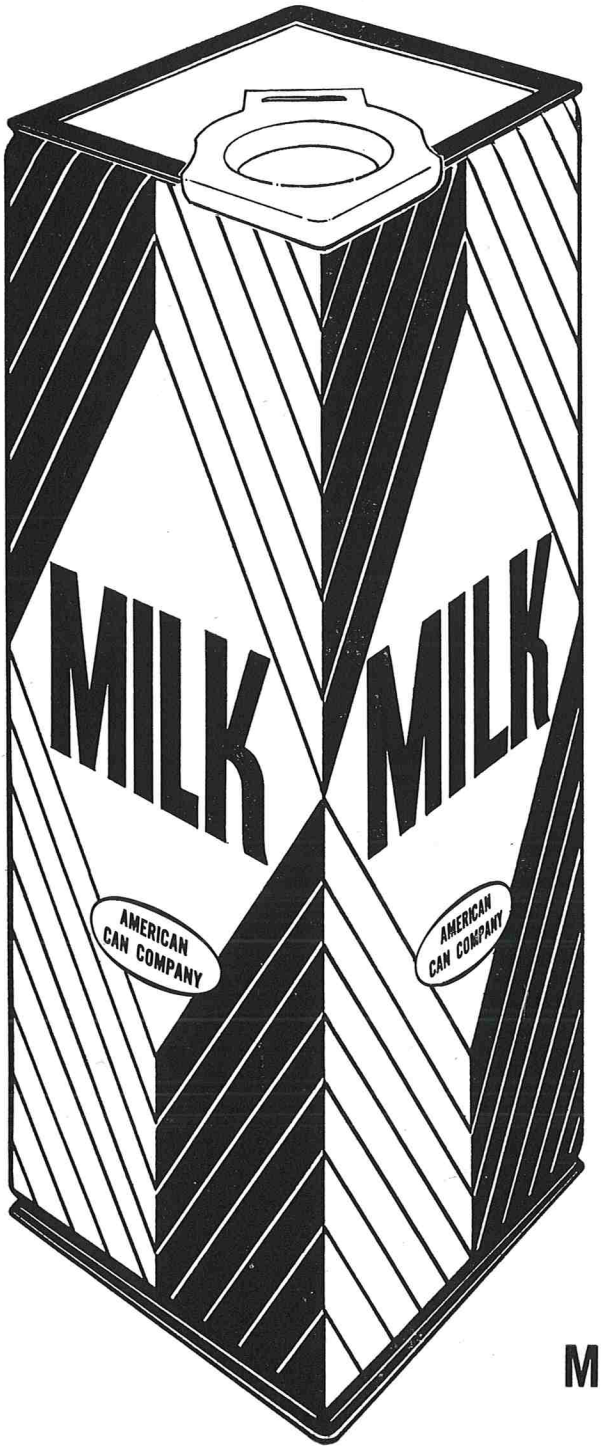

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