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Journal of

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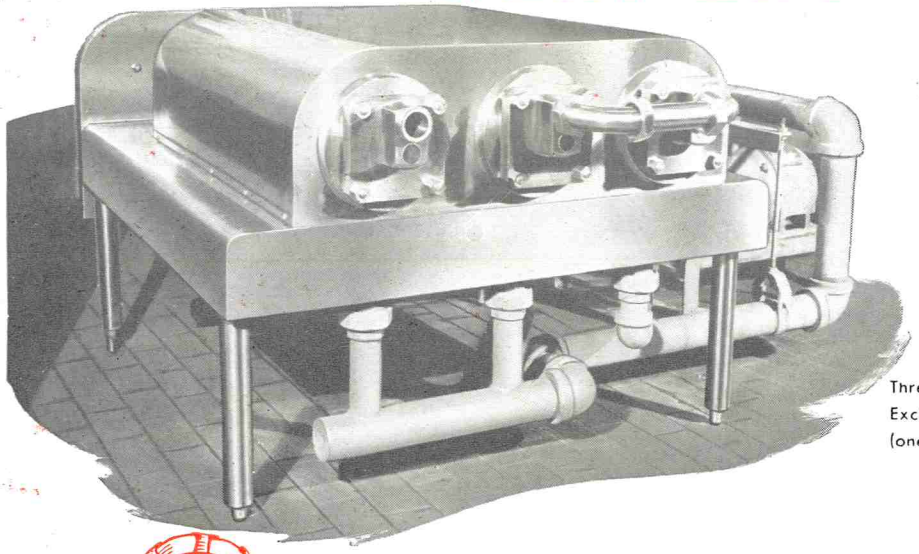

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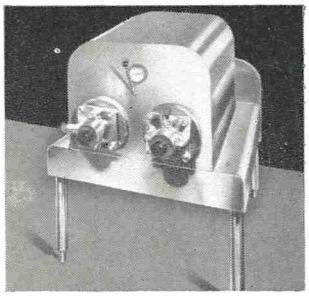

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Entered as second class matter at the Post Office at Shelbyville, Ind., March 1952, under the Act of March 3, 1879.

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"Instructions to Contributors" can be obtained from the Editor for the use of contributors of papers.

Journal of

MILK and FOOD TECHNOLOGY

INCLUDING MILK AND FOOD SANITATION

Official Publication

International Association of Milk and Food Sanitarians, Inc.

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Vol. 20 May No. 5

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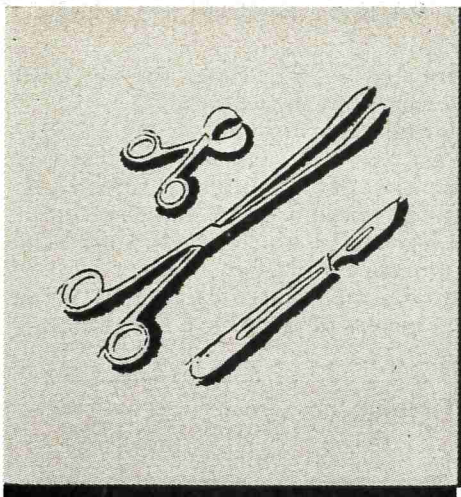
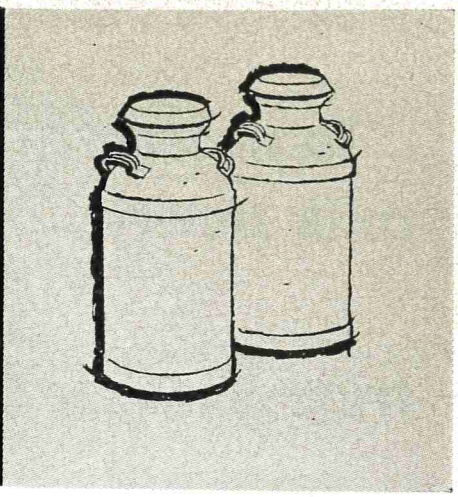
Subscription Rates: One volume per year
Individual non-members, Governmental and Commercial Organization subscription, 1 yr. $6.00
Public and Educational Libraries, 1 yr. $4.00
Single Copies $1.00

Orders for Reprints: All orders for reprints should be sent to the executive office of the Association, **P. O. Box 437, Shelbyville, Ind.**

Membership Dues: Membership in the **International Association of Milk and Food Sanitarians, Inc.,** is $5.00 per year, which includes annual subscription to the **Journal of Milk and Food Technology,** (including **Milk and Food Sanitation**). All correspondence regarding membership, remittances for dues, failure to receive copies of the Journal, changes of address, and other such matters should be addressed to the Executive Secretary of the Association, H. L. Thomasson, Box 437, Shelbyville, Indiana.





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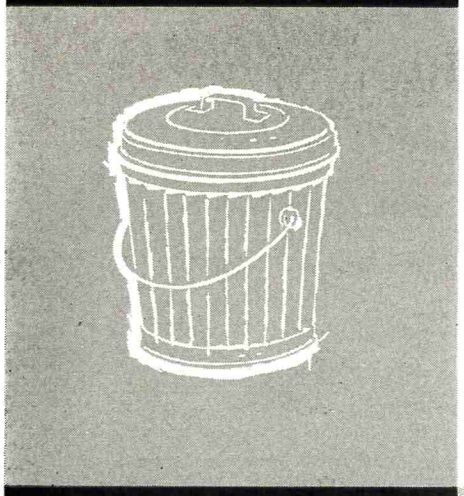

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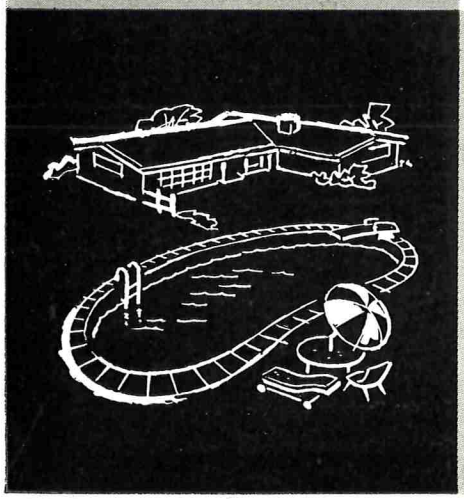
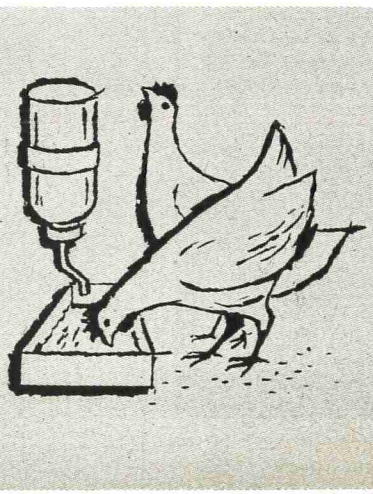
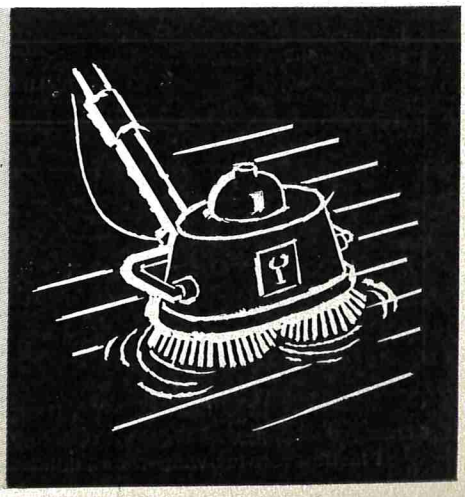






INFANT FORMULA INSPECTION PROGRAM AS AN AID IN THE PREVENTION OF DIARRHEA OF THE NEWBORN

J. A. Salvato, Jr. and Louis J. Lanzillo

Rensselaer County Department of Health, Troy, New York

Eight neonatal deaths occuring in an average size general hospital in Rensselaer County, N.Y., during 1954 were caused by an epidemic of diarrhea of the newborn.

During the investigation, samples of baby formula prepared at the hospital were obtained and tested according to state laboratory procedures[1]. The formulae so tested were found to be bacteriologically unsatisfactory. However there was never any clear evidence that contaminated baby formulae had caused the epidemic. In searching for a reason for the unsatisfactory samples, a number of "breaks" in accepted techniques were observed.

On the basis of the preliminary investigation, a baby formulae inspection program was organized in Rensselaer County utilizing a team consisting of personnel from hospital administration, the health department nursing division, the sanitation division and laboratory.

The objectives of the program in the initial planning stage were:

1. Establish appropriate lines of communication between the hospital personnel and the health department to insure continuing supervision and consultation service as required by the New York State Sanitary Code.
2. Assist in establishing procedures to minimize contamination of baby formulae, bottles and nipples during the handling and bottling processes.
3. Assist in establishing procedures designed to insure that terminal sterilization is adequately carried out.
4. Assist in establishing procedures to insure proper handling of the terminally sterilized product until time of consumption by the infants.

Orientation and Communication

The program was started by making an initial orientation visit at each of the hospitals by health department representatives. The objectives of the new program were explained to the hospital administrators and the staff members responsible for formulae preparation. Emphasis was placed on the fact that the health department and hospital had the common objective of providing a safe and satisfactory formula for each infant. Likewise the new program was characterized as a consultation service to aid the hospital rather than an inspection service. Ultimately the hospitals would carry the inspection program themselves and would utilize health department personnel whenever they had a problem. This approach was well received.

Emphasis was placed on the sanitary survey, and bacteriological testing was deemphasized as being only ancillary and confirmatory to the techniques followed and equipment provided. However, routine bacteriological testing was to be performed weekly by the health department on one bottle from among fifty bottles of each product prepared. The test specimen was to be selected and collected by health department personnel.

Administrators for the respective hospitals con-

Mr. Salvato received the B.S. degree in Civil Engineering from New York University in 1936 and the M.C.E. in 1939. He has served as district sanitary engineer with the New York State Health Department, as a sanitary engineer in the Army during World War II, and as Chief of the Bureau of General Sanitation in the Erie County Health Department, New York. He is presently Director, Division of Environmental Hygiene, Rensselaer County Health Department, New York. He has been a member of the IAMFS for more than 15 years and is an active member and contributor to many technical and scientific associations.

[1]Methods for Examinations Concerned with Sanitation, N.Y. State Dept. of Health, Division of Laboratories and Research, Form 18-a, Oct. 8, 1954.

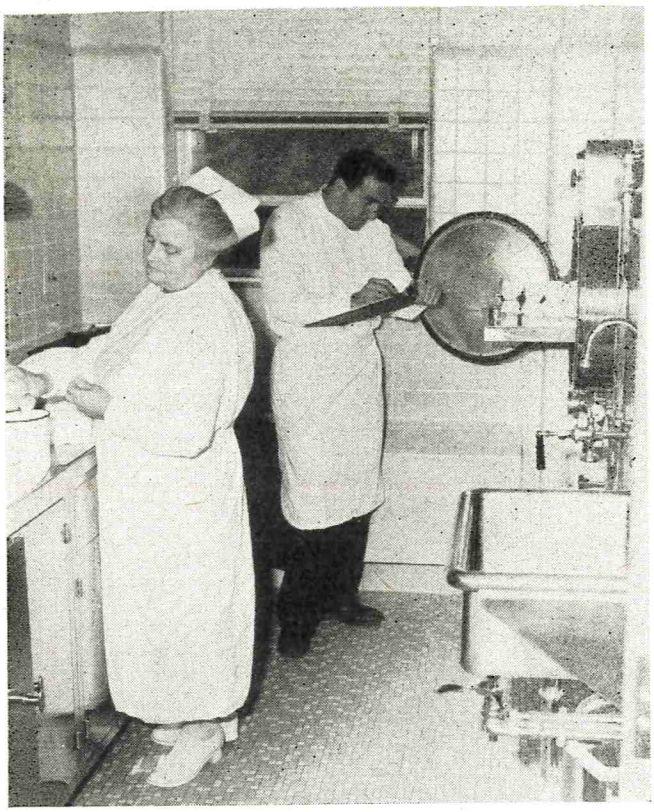


FIGURE 1. Formula preparation and terminal sterilization.

cerned accompanied the team on its initial inspection. The new control program included special study of the baby formula preparation room and the collection of process samples. Formula preparation techniques and operation procedures were observed (Figure 1). Following the joint inspection, a letter reporting findings and suggested recommendations, signed by the Health Commissioner, was forwarded to the administrator of each respective hospital.

IMPROVEMENT OF HANDLING AND BOTTLING PROCESSES

Acting on the premise that formulae should have a minimum of contamination prior to terminal autoclaving, an extensive investigation of the handling and bottling process was carried out.

Under the routine sampling procedure, a representative sample of each formula and each liquid was collected by a sanitarian from the Division of Environmental Hygiene at least once a week. A standard plate count and coliform count was made on each sample to check on the formula preparation. In addition to the collection of formulae, bottle and nipple rinses were taken to determine the effectiveness of the cleansing operation (Figure 2). A report of laboratory examinations on the formulae and rinses was delivered by the sanitarian each week to the supervisor in charge of the nurseries. The results were interpreted in her presence and needed improvements discussed.

The routine reinspections of the formulae preparation rooms disclosed that the following conditions were generally prevalent in the hospitals.

1. Equipment cleansing.
   a. Bottle brushes used for manual cleansing showed mineral deposits and grease at the base of the brush bristles. Brushes were also matted. Some poorly designed brushes caused scratching and chipping of the inside surface and lips of the formula bottles.
   b. One mechanical bottle-washer found in use was not designed to clean 8-ounce bottles. All bottles cleaned with this portable washer had black scuffmarks at the necks of the bottles caused by grinding action of the revolving metal brush arm against the narrow-neck bottles during the washing operation. The brushes were difficult to remove and were not disassembled daily for cleaning. Cultures taken from these brushes showed heavy growths of *Staphylococcus aureus* and *Staphylococcus albus*.
   c. Water pressures at the counter-type bottle spray rinsers were set too high to insure a thorough rinse of the bottles. The inside spray

FIGURE 2. Bottle washing — swab test in background.

TABLE 1 — INFLUENCE OF IMPROVED WASHING TECHNIQUES ON BACTERIOLOGICAL CONDITION OF TERMINALLY STERILIZED FORMULAE

Sequence	Standard plate count of samples					
	3 or less per ml.		4 to 10 per ml.		more than 10 per ml.	
	(No.)	(%)	(No.)	(%)	(No.)	(%)
Before change in washing operation	132	93	9	6	1	0.7
After change in washing operation	364	98	9	2	0	0

Note: Coliform organisms were not found.

"bounced off" the bottom of the bottle without actually rinsing the bottle.

2. Liquid soap was used to clean bottles and utensils.

3. Wire racks used for storage of clean bottles were rusted and greasy. The majority of the racks in use were galvanized wire. Cultures taken of the rusted racks by a hospital laboratory produced growths of *Staphylococcus albus* and non-hemolytic streptococci.

4. Formula bottles and nipples were in poor sanitary condition. The inside surfaces of many bottles were scratched, pitted or chipped. Some nipples were old and porous.

5. Utensils used in formula preparation were not in good condition. Funnels were dented, strainers rusted, and surfaces of mixing spoons and measuring spoons difficult to clean because of poor constructive features.

6. Heavy mineral deposits which could not be removed by normal washing procedure were found in most of the formula bottles and on utensils. Bottle rinses of cleaned bottles revealed extremely high total bacterial and coliform counts.

7. Daily records were not kept of the temperature of the maximum registering thermometer, pressure during terminal heating, number and type of formulae, and related data for each batch sterilized. In some instances there was no maximum registering thermometer on hand. Measurements of formulae temperatures and air space temperatures at about one-half the distance between the liquid and the nipple, showed the air space temperature to be 2° F. less than the temperature of the liquid.

8. Divided responsibility for the processed formulae was found to make possible delay in placing formula under refrigeration. Likewise no records were kept of refrigerator temperatures as a control measure.

RESULTS OF ANALYSES

The laboratory results on examination of formulae, fluids, and bottle and nipple rinses from three hospitals since the commencement of the new program are summarized in Tables 1 and 2. Process samples were collected to determine the presence of any weak links in the practices being followed.

Table 1 gives the results of standard plate counts of 515 samples. The difference in the plate counts, before and after changing the washing procedures, are significant. Application of the Chi-square test revealed that a difference as large or larger than that obtained will occur by chance only between 1 and 2 times in 100 trials. For statistical analysis, the groups were combined into standard plate counts per milliliter of 3 or less and 4 or more. Study of the table will show that a bacteria count of less than 10 per ml. in baby formula subject to terminal heating is easily obtainable. Actually a count of 3 or less is practical. Regulation 35, Chapter II, of the *New York State Sanitary Code* requires that the standard plate count of formulae which has been subjected to terminal heating be less than 25 organisms per ml., with members of the coliform group absent. *Control of Communicable Disease in Man*, Eighth Edition published by the Ameri-

TABLE 2 — INFLUENCE OF IMPROVED BOTTLE WASHING TECHNIQUES AS DETERMINED BY A BOTTLE RINSE STUDY

	Plate count[a] per bottle				Coliform count[a] per bottle					
	Less than 300		300 to 1000		1000 or more		Less than 1		1 or more	
	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
Before change in washing operation	28	27	13	12	64	61	83	79	22	21
After change in washing operation	59	91	2	3	4	6	62	95	3	5

[a]Plate and coliform counts on rinse samples made in accordance with Form 18-a (see footnote [1] in text).

can Public Health Association, 1790 Broadway, New York 19, N.Y. states (under epidemic diarrhea of the newborn) that coliform organisms should be absent and the total plate count should not exceed 10 organisms per ml.

Table 2 summarizes 170 plate and coliform counts of bottle rinses made to determine the effectiveness of bottle and nipple washing. The improved technique resulted in 91 percent of the rinse samples examined showing less than 300 bacteria per bottle as compared to 27 percent before, and 95 percent of the rinse samples showing no coliform organisms as compared to 79 percent before the new procedures were adopted. A proper washing procedure should result in plate counts of less than 300 with no coliform organisms present in 8-ounce bottle rinses. The differences in the plate and coliform counts, before and after changing the washing procedures, are highly significant. Application of the Chi-square test revealed that a difference as large or larger than that obtained will occur by chance less than 5 times in 1000 trials.

Washing Technique Modified

The modified washing operation that was instituted in each hospital consisted of the following:

1. All scratched and chipped bottles as well as old and porous nipples were discarded.
2. All bottles and nipples were thoroughly rinsed in lukewarm water immediately after use to simplify and make more effective the subsequent cleansing operation.
3. All bottles and nipples were initially pre-soaked in a 5 percent organic acid milkstone remover for 15 minutes to remove heavy mineral deposits which were evident in most of the bottles and nipples.
4. All bottles and nipples were subjected to weekly treatment in a 1 percent organic milkstone remover to prevent further mineral deposits from building up. A milkstone remover used in the dairy industry was effective.
5. A detergent was substituted for soap in washing the bottles and nipples.
6. Finally, the bottles and nipples were thoroughly rinsed after washing. The bottle spray rinsers were readjusted to insure a thorough rinsing.

Nipples A Special Problem

The necessity for boiling nipples became apparent when swab tests made on supposedly cleaned nipples showed extremely high plate counts as well as high coliform counts. A swab was moistened in a freshly-opened vial of sterile buffered rinse solution and rubbed slowly and thoroughly four times over the inside surface and ridge of the nipple. The swab was replaced into the vial and the stick was broken off above the cotton by using the edge of the vial as a fulcrum. A single swab was used for each individual nipple. Table 3 summarizes the results of 34 nipple

Table 3 — Bacteriological Results On Swabs From Bottle Nipples

Nipple treatment	Coliform count per swab[a]	Standard plate count per swab[a]
	20	10,000
	9,200	41,000
	0	15
	0	20
Nipples washed	1,520	TNTC[b]
in green soap.	0	31,000
Picked at random.	0	2,500
	0	TNTC
	0	TNTC
	0	TNTC
	0	TNTC
Nipples soaked	8,200	TNTC
in a quaternary	60	TNTC
ammonium solution	30	TNTC
overnight.	540	TNTC
	0	0
	0	10
	0	0
	0	20
	0	5
	0	20
	0	75
	0	10
	0	25
Nipples washed in	0	5
a detergent and	0	10
boiled 5 minutes.	0	0
	0	0
	0	0
	0	10
	0	0
	0	5
	0	0
	0	15
		5

[a]Swab test made as explained in text.

[b]TNTC = too numerous to count.

Table 4 — Comparison of Bottle Rinses From Autoclaved Bottles and Properly Washed Bottles

Standard plate counts	Number of autoclaved bottles	Number of properly washed bottles
Under 100	16	49
100 and over	2	6

swabs. The ineffectiveness of ordinary cleaning or soaking in a quaternary ammonium solution, and the superiority of boiling nipples for 5 minutes is shown.

It was also learned, as may be seen by inspection of Table 4, that bottles that had only been properly washed gave counts approximately equal to that of bottles that had been autoclaved. Autoclaved and properly washed bottles were cleansed as explained under "Washing Technique Modified".

TERMINAL STERILIZATION

This process should be the final one. If proper handling has occurred prior to terminal sterilization it should be possible to produce a formula with a standard plate count of 3 or less almost 100 percent of the time, with coliform organisms being uniformly absent.

SUMMARY

Periodic inspections by the Rensselaer County Health Department on a team basis was found extremely effective in making full use of the combined talents of the resources available in a modern county health department having a properly staffed laboratory. The cooperation given by the personnel in charge of the maternity sections at the respective hospitals helped accomplish in a relatively short time the improvements listed below.

1. The bottle and nipple washing operation was modified. All bottles and nipples are now immediately rinsed with lukewarm water after use to remove milk film and soaked at least once a week in a mild organic acid milkstone remover to remove and prevent mineral deposit build-up. A detergent is used to clean bottles, nipples and utensils instead of a soap.
2. All nipples are being boiled daily.
3. About 100 to 150 scratched, chipped and pitted bottles as well as 50 to 75 old and porous nipples have been discarded.
4. The water pressures at the bottle spray rinsers have been adjusted to insure a thorough bottle rinse.
5. Stainless steel bottle racks are on order to replace rusted racks that are presently being used at two hospitals.
6. The temperature attained by formulae and fluids during terminal heating is being determined by a maximum registering thermometer at all three hospitals.
7. Each hospital is now keeping a daily record of the maximum temperature of the maximum registering thermometer, the pressure indicated during terminal heating, and the number of formulae and fluid bottles for each batch autoclaved. Records are also kept of the temperature of each refrigerator in which formula is stored.
8. Poorly constructed and rusted utensils used in the formula preparation are being replaced with stainless steel types that are easily cleaned and maintained.
9. The metal brush spindles on the mechanical bottle-washer that was causing the black scuffing on the inside necks of the bottles are being replaced by the manufacturers with a plastic type spindle which will eliminate the grinding action causing the scuffing.

CONCLUSIONS

Health Department team supervision of maternity hospitals is necessary. Important members of the team are personnel from the laboratory, and sanitarians. Formula preparation may be a causative factor in diarrhea of the newborn epidemics. To deal with this problem emphasis should be placed on the sanitary survey rather than on laboratory tests alone. Proper techniques and procedures in formula preparation are necessary to insure that terminal sterilization will be effective. The Rensselaer County Health Department has developed a baby milk formula program which should aid in the prevention of epidemics of diarrhea of the newborn.

ACKNOWLEDGMENTS

This study was made possible through the cooperation of Dr. Andrew C. Fleck, Commissioner of Health. Thanks are due Mrs. Mildred Burns, Director of Nursing, for assistance in initiating the study, to Mr. Nicholas Sopchak, Sanitary Chemist, under whose direction the laboratory work was performed, and to Mr. Robert Frei, Statistician, for assistance in statistical analyses. All are with the Rensselaer County Health Department, Troy, New York.

THE USE OF SEMI-PERMANENT MOUNTS IN SANITATION COLLABORATIVE WORK[1]

Ross H. Cory

General Mills, Inc., San Francisco

Due to the failure of technicians to agree on their results, it is very difficult to obtain significant answers to problems of sanitation analysis through collaborative tests. Much of the reason for disagreement is individual differences in ability to count fragments and rodent hairs.

The paper describes a technique whereby these differences are smoothed out. Filter papers bearing residues from sanitation tests are embedded in a thin layer of paraffin and read collaboratively. The paraffin is melted while the filter paper is being read, and then solidifies, anchoring all particles in place.

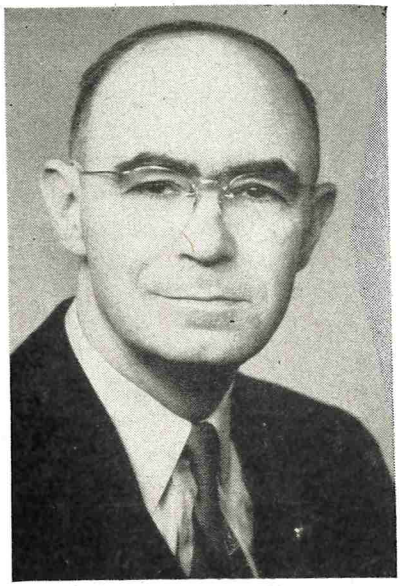
In addition to giving more reliable results, the paraffin-coated slide technique has shown its self to be a good training medium.

A serious obstacle in the path of anyone attempting to evaluate a method of sanitation analysis is the difficulty of obtaining agreement between collaborators. This is particularly true when working with flour and other cereal products.

In this type of material, any insect tissue or rodent filth that may be present are so pulverized that many particles are not detected, and of those located, many cannot be recognized. This difficulty is further complicated by the fact that most of the persons doing sanitation analyses in cereal laboratories are chemists who have had little or no formal training in microscopy or insect morphology.

The results obtained on the 1953-54 American Association of Cereal Chemists Sanitation Check-Sample series are typical of what may be expected. On the sample of this series where the agreement was best, the highest number of fragments reported was five times that of the lowest. On the sample where the agreement was poorest, the ratio between high and low was 63:1. The mean of the high-to-low ratios for 10 samples of the series was 26:1 (*1*). These differences can be caused by; (a) lack of uniformity of sample, (b) differences in methods, (c) differences in ability to find and recognize fragments and rodent hairs, and (d) differences in manipulative skill.

Since the fall of 1953 much of the work of the Sanitation Methods Committee, A.A.C.C. has been pointed toward finding ways to overcome, eliminate, or cancel out these causes for differences. The most effective technic developed has been the use of semi-permanent mounts for filter papers containing fragment and filth bearing residues.



Mr. Cory received the B.S. degree from the College of Puget Sound, Tacoma, Washington in 1931. Mr. Cory is Service Chemist for General Mills, Inc., at San Francisco. He has been very active in the field of Cereal Chemistry and has served as Chairman of the Sanitation Committee of the Pacific Northwest Section, American Association of Cereal Chemists as well as Chairman of the Sanitation Methods Committee of that organization.

Method

The papers containing the residues are embedded in a thin layer of paraffin. While the slides are being read, the paraffin is melted so that the effect is the same as though the filter paper has been cleared with mineral oil. When the reading is completed, the resolidified paraffin anchors all particles in place, allowing the slide to be sent to another person to be read collaboratively. One type of light in general use (2) furnishes enough heat to melt the paraffin while the slide is being read. Those who do not use this light may use a substage warmer consisting of a 100 watt light bulb enclosed in a box.

Special filter papers are used. They are marked off in 5.0 mm. cross sections. The squares are identi-

[1]This is the third of a series of papers which were presented at the Second Conference on Problems of Extraneous Matter in Foods, arranged by Dr. J. D. Wildman, Department of Plant Science, Syracuse University, Syracuse, New York, and held at that university April 16, 1956.

fied by letter and number, allowing the collaborators to report not only the numbers of insect fragments and rodent hairs found, but also their exact locations. The filter papers are ruled with a rubber stamp and green ink (3). Similar cross-sectioned filter papers are now available commercially (4). They are excellent for routine work; however, if they are to be used for collaborative work it is necessary to print the identifying numbers and letters on them by hand.

In practice, the slides are routed in pairs to groups of collaborators ranging in size from five to ten persons. Depending upon the information wanted, these collaborators report either the exact locations (by squares) or the numbers of insect fragments and rodent hairs found on each line. After the slides have been read, a summary of the reports is prepared, and distributed to the collaborators. The slides are rerouted to them in order to give them an opportunity to review the slides in the light of the report.

ADVANTAGES OF THE TECHNIC

The use of these semi-permanently mounted filter papers has many advantages in the study of sanitation methods. They are as follows:

1. One of the slides of the pair being circulated always contains the residue from a test by a "standard" method. The other one contains the residue from a test on the same flour by some variation of this "standard" method. A comparison of the averages reported by those who read the slides collaboratively gives a much better indication of the relative numbers of fragments and rodent hairs present than would be obtained if they were read by only one person.

2. A method has been devised to analyze, statistically the composite reports of a group of collaborators (5) and assign a numerical accuracy rating to each collaborator. Some of the factors having an influence on an individual's accuracy have also been measured and correlated with the accuracy ratings. This has given some insight into the reasons why a person may or may not be an accurate worker. Being able to promise and perform this service has helped very much in the recruitment of collaborators to work on committee projects, as this is something that will be of immediate and practical benefit to them.

3. It has made possible the measurement of the consistency of performance of individuals when reading slides.

4. The collaborative reading of these slides has helped to improve the recognition skills of those taking part in the work. The calculation and assignment of accuracy ratings (5) has given each one an indication of how he stands, in comparison to the group. The figures are broken down, also, to show if he is lacking in visual acuity, is reckless or overcautious in naming a fragment or rodent hair, and whether, compared to the group, he is a rapid or slow worker. At the end of last year's work (1954-55 season) each collaborator was asked if his participation in the work had helped him to improve his recognition skills. The answer was an almost unanimous "yes".

This improvement is expected to result in better agreement and therefore more significant information to be obtained from the projects of the Sanitation Methods Committee.

TECHNIC PRECAUTIONS

There are some precautions that must be observed when the paraffin coated slide technic is used. Metal dishes are much more satisfactory than the usual petri dishes. It has been found that the flat, metal lids for friction-top cans, known to the can trade as "plugs", make ideal dishes for this purpose. The manner in which the edge is formed stiffens and re-inforces them so that they may be mailed with only slight danger of their being damaged. When a sub-stage warmer is used, the bottom light would be distracting if a petri dish were used. Use of a metal dish avoids this. The minimum possible amount of paraffin should be used. If the filter paper is covered with a thick film of paraffin, the heat necessary to melt it may set up convection currents which will cause lighter particles to shift their positions. It has been found that when a 7 cm. filter paper is used, about 0.7 gram of paraffin is satisfactory. The filter paper should not be allowed to dry before it is embedded in the melted paraffin. It will curl as it dries and then cannot be made to lie flat in the dish. Also, if the paper is moist and flexible, it can be rolled into the melted paraffin in such a way that the minimum amount of air will be entrapped under it. A dry paper has a further disadvantage in that more paraffin will be required to inpregnate it.

Collaborators should be warned that the paraffin must be held at a high enough temperature so that a ball will not form on the tip of a cold probe. If this happens, fragments may become shifted or lost.

REFERENCES

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3. Furnished through the courtesy of Carl Schliecher & Schuell Co.
4. S and S "Quadrant Ruled" filter papers.
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REPORT OF THE COMMITTEE ON DAIRY FARM METHODS — 1956[1]

Problems Related To The Pickup Of Milk From Farm Tanks By The Tank Truck And Its Transportation To The Plant.

A recent publication of the U.S. Department of Agriculture Farmer Cooperative Service, "Bulk Milk Handling in 1955," estimates on the basis of a nation-wide survey that there were in excess of 17,700 bulk farm tanks in use in March 1955. A similar survey made in June 1953 indicated that 6,150 bulk tanks were in use at that time. Thus, the number of bulk tanks in use nearly tripled in less than two years. This report cautiously concludes that "the peak in expansion of bulk milk handling has not been reached." A later survey by the National Association of Dairy Equipment Manufacturers indicates that as of January 1, 1956 there were 30,330 bulk milk tanks in use on farms throughout the United States — an increase of 127% over a similar survey in 1954. In its May 1956 issue *Milk Plant Monthly* estimates on the basis of their survey of milk market administrators throughout the country that at that time there were 54,000 farm tanks in use and predicts that this figure will double within the next year.

Obviously, as bulk milk handling increases, its attendant problems pyramid. A great deal has been accomplished in the field of structural specifications: the formulation of the 3-A Standards for bulk handling equipment and the adoption of plans for efficient milk houses and milking parlor arrangements through regional cooperation. This work still progresses. However, problems involving regulatory and procedural methods have been approached much more cautiously. There were no guideposts for this revolutionary system of milk handling and the questions posed were complex and far-reaching in scope. Each segment of our industry had to evolve its own solutions to immediate problems and few dared to venture further.

However, a new trend is now noticeable. As the growth of bulk handling demands regulatory control, many states and markets feel the need of pooling their now considerable experience toward solution of their common problems. Significant meetings between representatives of industry and control agencies are taking place on local levels as well as on a regional. One of the most outstanding achievements of this kind within the past year has been the development of "*Joint Policies Governing Handling of Grade A Bulk Milk from Dairy Farm to Dairy Plant,*" by representatives of the Departments of Health and Agriculture of seven midwestern states, and representatives of the U.S. Public Health Service. These joint policies constitute the most complete approach to the various phases of bulk handling yet encountered.

This Committee offers the following comments relative to these policies in relation to the other regulations submitted to us:

1. Very few of the regulations and proposed regulations submitted to this Committee for study require a sketch of the milkroom floor plan. Those that do, provide exception for space requirements in already existing buildings of Grade A producers.

2. Clearances of 36 inches, as recommended under this section, are greater than required on most markets. The minimum noted in other regulations is 18 inches; the majority indicate 24 inches.

3. Although regulations specifying capacity for hot water storage do generally require a minimum of 30 gallons, this Committee recommends, as it did in its 1953 report, that hot water capacity be not less than 50 gallons.

4. On the subject of "milk conductor tubing," or hoses, the widest divergence of opinion was noted in the regulations submitted.

Sectional lengths permitted varied from 8 to 12 feet. Overall lengths permitted varied from 8 to 12 feet. This Committee recommends that adequate facilities be required for the proper washing and sanitizing of whatever length hose is approved.

5. Surely, the requirement that walls be painted white does not refer to the walls of glazed tile that are frequently used.

Having pointed out major points of difference between the majority of the regulations studied by the Committee and these "Joint Policies," we would like to point out also that there are certain points of similarity that are almost universal:

1. Adherence of equipment to 3-A Standards.

2. The examination and licensing of tank truck operators.

3. Approval of the tank installation by the regulatory agency.

4. Provisions for efficient construction and sanitation, adequate light, space, and ventilation; hot and cold water under pressure; and measures for the protection of the tank and its contents from contamination.

[1]Presented at the 43rd Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Seattle, Washington, September 5-7, 1956.

In connection with the requirement of the "Joint Policies," Section III, Item 7, that all sampling follow *Standard Methods for the Examination of Dairy Products*, the following comment by Milton E. Held, of the U.S. Public Health Service, is noteworthy:

> "Insofar as sampling for bacteriological analysis is concerned, no major problems have developed. *By adhering to 'Standard Methods' with the responsibility for sampling and types of sampling devices and equipment being determined on the local level,* this has worked out very well because of the recently inaugurated policy of local laboratory surveys by State laboratory people as delineated in the rules of the National Conference on Interstate Milk Shipment."

While we agree that responsibility as underscored above properly lies with the locality, it must be pointed out that herein lie some of the knottiest problems facing the industry today; for example, the merits of dry or wet ice for sample refrigeration; the use of single service pipettes rather than a dipper for procuring samples from farm tanks; whether the producer or the tank truck operator should provide the sampling dipper; the use of composite versus fresh samples for determination of butterfat averages; the size and type of sample bottles; the engineering of efficient sample containers, and many others. Such questions are, in effect, extensions of the laboratory and all lie within the framework of "Standard Methods."

In regard to sampling equipment and procedure, the Northeast Regional Farm Practices Committee at its June 1956 meeting in Hartford, Conn. had the following recommendations to make to this Committee:

1. Milk samples for laboratory examination and butterfat testing shall be maintained in the temperature range of 36 – 40°F. at all times. (This is within *Standard Methods* limits; however, some markets have regulations permitting temperatures as high as 50°F.)
2. Further exploration of the combination plug-and-cap type cover for composite bottles on farm tank trucks as to the possibility of this dual type replacing the present plug or cap. Limited experimental use of the combination cap indicates it overcomes the problems encountered where the plug or cap is used separately.
3. Milk sampling for butterfat testing and bacteriological examination shall be covered under one license for farm tank truck drivers by both a written and field-demonstration examination. Where interstate farm pickup is operating, the driver to be licensed by the various states.

Ultimately, there is the problem of how samples for bacteriological examination may be collected by the control agencies. In many markets recognition is now being given to driver-collected samples by the regulatory agencies, or the proposition is being considered. The remarks below are a representative sampling of the many that have been addressed to this Committee on this subject:

> *Mr. Alex G. Shaw, Chief Dairy Supervisor, Dept of Agriculture, Gainesville, Fla.*: "Methods of collecting samples for bacteriological and butterfat analysis is a problem the various cities have found to be a very expensive one, if they expect to continue to try to collect samples with their own personnel. They all realize they must change, but are reluctant to turn the work over to some other agency."
> *Mr. Russell R. Palmer, Chief Milk Inspector, Detroit Dept. of Health*: "During 1955 we took all our own samples at the farms, but with the increase of number of tanks, costs were prohibitive so we turned to the tank drivers or haulers. The proper licensing of the hauler by state or local agencies to take official samples will probably be the only satisfactory answer to this phase as time goes on. In Michigan we had such a law in the making, but a legislative jam prevented its passage late in the session. It will be reintroduced in the next session."
> *Mr. W. R. Knutzen, Dept. of Agriculture, State of Washington*: "Industry counts from approved laboratories have been and are being used by regulatory agencies for grading purposes . . . occasionally regulatory agencies take some routine samples for a check or comparison."

One question which presents itself in markets where the regulatory agency wishes to utilize samples collected by the tank truck driver is: shall sterile bottles always be used in order that the sample may be used for either butterfat or bacterial determination, or shall samples for bacterial count be taken only on days when the driver is supplied with sterile bottles (and instructed as to the day of official sampling)? Of course, this question does not arise in markets where composite samples for butterfat testing are made up rather than using the average of fresh samples.

The Universal Sampling Procedure as worked out by the City and County of Denver follows the first procedure and provides a simple and inexpensive method of collecting samples from farm tanks. Eight-ounce samples are taken in sterile bottles by licensed drivers from each farm tank at every pickup, portions of which are used for butterfat tests, bacteria tests, and flavor, sediment, and "solids-not-fat" testing. The Health Department notifies the dairy when they desire to use a portion of the sample for official bacterial counts before milk is removed for any other purpose. Because this procedure contains certain important advantages, it is being given favorable consideration in several sizable markets. These advantages are:

1. Enables the regulatory agency to obtain official samples at a fraction of the cost of going to the farm to collect them. (In some markets it would be necessary for the regulatory agency to secure its own sample when a producer's average bacterial count exceeded the legal limit and some official action was indicated.)
2. Provides a uniform and standard procedure for collecting samples.

3. Makes it impossible for the producer to anticipate when samples for official use will be selected.

After numerous meetings of the plant operators, quality control fieldmen, and State Health Department representatives, the Universal Sampling Procedure Agreement was formulated for the City and County of Denver, along with Proposed Minimum Requirements for Bulk Milk Handling, Application for Installation of Bulk Milk Cooler, and Tank Driver Instructions, as "a beginning to attack the problems that confronted all departments." Through the cooperation of all facets of the industry, this community has acted promptly and effectively to present a workable and realisitc approach to bulk milk handling.

While the Committee on Dairy Farm Methods has concerned itself with regulations controlling bulk milk production and handling as an extension of its interests, it is felt that further study and recommendations for the adoption of regulations can best be carried forward by the Regulatory Committee of this Association. Therefore, it is our recommendation that this subject be referred to that Committee for joint consideration.

TYPES OF MILKING PARLORS IN RELATION TO NEW TYPES OF EQUIPMENT

"Alterations of milk houses on the farm" was the second most frequently mentioned problem in the survey conducted by the Farmer Cooperative Service, U.S.D.A., for its report on "Bulk Milk Handling in 1955." This report states that "while such alterations may involve minor technical problems, it may be assumed that the cost pyramided on top of the purchase price of the farm tank was the real problem."

A letter to the chairman of this Committee from H. H. Wilkowske, of the IAMFS Executive Board, states that the Florida Association of Milk and Food Sanitarians' Council on Sanitary Standards and Procedures resolved: "That the Farm Methods Committee consider undertaking a study of types of milking barns, in relation to new types of equipment, such as pipeline milkers, tanks, etc., including layouts, especially with respect to future developments." Dr. Wilkowske explains in his letter that "our problem in Florida is that barns are still being constructed which will not lend themselves to later conversion for pipelines without risers."

Even though control agencies in most markets make some exception for Grade A producers installing modern equipment in older-type buildings, there frequently is some incidental inconvenience and expense. Fortunate is the dairyman who has the opportunity to construct new dairy buildings with installation of labor-saving equipment in mind either for the present or the future. However, it is unfortunately true that new dairy buildings are still being constructed which do not incorporate features conductive to efficient installation and operation of modern dairy equipment.

The dairyman faced with the necessity for new dairy building must first decide between the conventional stanchion barn and the system known as "loose-housing." Because this latter system is relatively new and rapidly gaining in popularity it has been the subject of much recent study. Two excellent studies, both resulting from regional cooperation, have come to our attention. They are:

1. *Standards for Design and Operation of Loose-Housing Systems for Dairy Cattle in the North Central Region — 1956.*
2. *"Uniform Milk House Plans for Bulk Milk Handling — Northeast Region".*

For new construction, the Mid-West "Standards" recommended the same space requirements for the floor areas of milk rooms as that recommended by the "Joint Policies" referred to above. The Northeast group at their June 1956 meeting recommended approximately the same minimum sizes for milk houses.

MILK HOUSE FLOOR CONSTRUCTION

When a farm tank is to be installed, considerable additional weight will be placed on the milk house floor — a 300-gallon tank full of milk weighs approximately 3,385 pounds. If the floor should settle after the tank is calibrated, accurate weights of the milk shipments cannot be obtained.

The Mid-West "Standards" give directions for floor construction as follows:

> 'When this floor (milk house) is to support a bulk milk tank in which milk is to be measured, it should be stable in summer and winter and be capable of carrying the load placed on it. This type of floor can be provided by removing all top soil and backfilling with at least 8 inches of sand, gravel or crushed rock. Where top soil is firm, reasonably free of organic material and little affected by freezing, a sand or gravel fill or 4" to 6" may be adequate. A concrete floor reinforced with 6 x 6 #10 welded mesh steel and 5 inches in thickness placed over this stabilized fill should prove adequate."

The following are alternate directions which may be used in new and old construction to assure a permanent floor which will not settle:

New Construction: Pour two parallel footings 8" wide and approximately 16" deep for the width of the tank to be installed and placed under the area where the legs of the tank will rest. The depth of the footing necessary will vary, depending on the amount of fill

used. When the finished floor is poured over the footing, square a one inch board about 8" x 8" in the finished floor in the spots where the tank legs will sit. When the floor sets up, take these out, set the tank in the depressions that are left, then float a smooth finish of rich cement around the tank legs flush with the floor. This assures a permanent position for the tank and gives a perfectly smooth floor. With this method the standard floor thickness (4 inches) may be used.

Old Construction: A careful check of the existing floor should be made. If there is any evidence of floor settling around the side walls or serious cracking of the floor, a new slab of flooring about 4 inches thick should be poured over the old. Usually, it is necessary to break in the floor blocks at the floor line and insert some reinforcing steel in this new floor.

CONCENTRATE FEED STORAGE

The following arrangement for the feeding of concentrates, as outlined in the "Standards" referred to previously will be of interest:

> "A feed storage leading to chutes and metering feeders, of sufficient size to hold the amount of feed commonly prepared at one time is a necessary part of an efficient farm milking plant where cows are to be fed at milking time. This feed storage should be dust tight, dry, well ventilated, rodent proof and arranged for convenient filling. It may be arranged for hand feeding or for metered feeding at each milking stall. Arrangements that have been conveniently used by dairymen include the following: Overhead storage in hopper bottom bins leading to chutes to individual milking stalls. Bulky feeds do not feed down well in hopper bottom bins and, if used, a mechanized agitator may be required. Feed room or bin with hopper bottom may be built into milking room wall. Feed rooms may be equipped with a feed box at waist height into which the ground feed may be shoveled before milking starts. The feed bin is usually long and narrow, and has a sloping bottom which feeds into the waist high feed box. Such a feed box should be convenient to the operator and it should be equipped with a tight closing door."

On farms where pipeline milkers are used, it has been found troublesome to secure the production records of the individual cows. On days when the D.H.I.A. tester visits the farm it is necessary to delay milking and is otherwise inconvenient. We wish to report that devices are now on the market which permit the individual cow's production to be recorded without delay or interruption of the use of the pipeline milker.

We believe this report bears out the fact that regulatory agencies and industry are now working together to vigorously attack the problems presented by the revolutionary changes introduced by bulk milk handling. We shall soon see the crystalizing of thinking in the formulation of regulations which will have a certain basic uniformity.

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REPORT OF THE COMMITTEE ON ORDINANCES AND REGULATIONS PERTAINING TO MILK AND DAIRY PRODUCTS — 1956[1]

The Advisory Committee on Ordiances and Regulations has continued to promote uniformity of ordinances and regulations governing milk and milk products with emphasis being placed on milk that is to be used for manufacturing purposes. It is the opinion of the Committee that more attention should be given to the sanitary requirement for the production of milk used for manufacturing purposes with corresponding emphasis on appropriate quality standards. Present provisions in state standards for production of milk for use in manufactured dairy products clearly indicate that there is a real need for more uniform requirements with adequate application.

The 1955 Committee requested that two questions be submitted to the Applied Laboratory Methods Committee for further consideration. The first question submitted to the Laboratory Committee was that of optimal incubation temperature for standard plate counts. The second question was the necessity to run confirmatory tests on all samples of milk or milk products where solid media is used for the determination of coliform counts.

Frozen Dairy Foods

Considerable time was spent during the year in making revisions in the "Suggested Regulations Governing Roadside Stands Dispensing Frozen Dairy Foods." After considerable discussion, it was decided that a new suggested ordinance and code on frozen dairy foods would not be necessary if the terms "frozen dairy foods retailer" and "counter freezers" could be adequately defined and included as a part of the present and future regulations of the U. S. Public Health Service Code Governing Eating and Drinking Establishments. It is recommended that adequate definitions for "frozen dairy foods retailer" and "counter freezers" be developed which can be incorporated in the U. S. Public Health Service Recommended Code Governing Eating and Drinking Establishments. This will supply the need for adequate recommended regulations governing the sanitary control of this type establishment.

Summary of Manufacturing Milk Requirements

Of the 48 states, 22 have some specifications for milk for manufacturing purposes; however, only 6 have definite grades or classes based on both bacterial and sediment requirements.

Twelve of the 22 states listed provide for a warning, borderline or probationary classification in which milk below the acceptable classification is accepted pending efforts to correct the situation. One of the 12 states provides for a range in the Warning category from 2.5 to 5.5 mg. of sediment. Seven of the 12 states specify a limited time in which this milk may be accepted. This period varies in case of sediment from 6 to 10 days and in the case of bacterial counts from 4 to 10 weeks.

Eight of the 22 states listed make provision for the difference between "acceptable" (lawful) and "unacceptable" (unlawful or reject) milk based on either bacterial estimate, sediment or both.

Five of the states listed mention "acidity" as a quality requirement. One state sets an acidity limit for grade one milk but does not set a limit for grade two. Three states use acidity as a means of segregating lawful and unlawful milk. One state merely specifies a maximum acidity of acceptable milk with no reference to the milk being rejected over the maximum.

Of the 11 states that refer to bacterial requirements, 6 specify monthly testing and 3 semi-monthly. Two states mention bacterial requirements but do not specify the frequency on which these determinations are made. One of these two states, however, follows the policy of testing for bacteria twice monthly. If direct microscopic count exceeds 3 million, the milk is immediately rejected and the shipper is visited by a state inspector and not allowed to ship until the trouble has been corrected.

Two other states provide for bacterial testing on an optional basis but do not specify any limitations or frequency of testing.

Nine of the states listed express the sediment standard in terms of a numerical figure assigned to their visual sediment chart, without reference to the quantity of sediment for the individual grades, classifications, or the rejection level, as the case may be.

Eight of the states listed express the sediment standard in terms of mg. of sediment for each grade or at the rejection level, whichever the case may be.

One state designates the sediment standard in terms of Fair, Poor, and Illegal, and another state refers to the reject classification as Dirty with no visual chart as a guide.

One of the states does not specify any sediment standard to follow.

Six of the states, expressing sediment in terms of mg., make their rejection on all sediment over 2.5 mg.

[1]Presented at the 43rd Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Seattle, Washington, September 5-7, 1956.

One state rejects at 3.0 mg. and another rejects the milk when the sediment exceeds 3.0 mg.

In the case of sediment 5 states require monthly testing, 14 states semi-monthly and 3 states do not specify frequency.

Nineteen states refer to the flavor and/or appearance of milk as a basis of acceptability or rejection, whereas three states make no mention of this factor as a quality requirement.

Nine states require cooling and 5 of these 9 refer to a specific temperature requirement for the milk at the time it is received at the plant and one additional state specifies a recommended figure.

In 4 of these instances 2 hour delivery is accepted in lieu of cooling.

Thirteen of the 22 states listed require coloring of "illegal" or 'reject" milk; 5 of the 13 require coloring by State enforcement agency; one by authority of State enforcement agency; and 7 states allow plant personnel to color illegal milk.

Ten of the 22 states outline in more or less detail, specific farm requirements which the producer must meet; 2 states use a Grade A Farm Score Sheet in rating the farms with a lower percentage of compliance than for Grade A.

Seven of the 22 states refer to farm requirements in a general way.

The line of distinction between the classification of *detail* and *general* was in some instances difficult and the decision was made arbitrarily.

Fifteen of the states listed have some requirement regarding transportation (trucks) varying from merely providing protection from contamination, to enclosed and insulated bodies.

Eleven of the states listed specify requirements for cans with reference to construction, condition and sanitation.

Six of the states listed require licensed milk graders.

Three of the states listed require a price differential between grades of milk.

Two of the states listed require that producers submit a record of quality performance of their previous shipments when transferring from one company to another.

SUMMARY OF MANUFACTURING CREAM REQUIREMENTS

Of the 48 states, 27 have some specifications for manufacturing cream; however, only 18 states have specific grade designations based on one or more of the following factors: sediment, flavor, appearance, acidity and frequency of delivery.

In addition, 10 of the states use a minimum butterfat requirement for grade classification in the case of first grade or better and 8 states use frequency of delivery as an added factor for grade segregation.

Twenty-five of the states listed require sediment testing, 8 of which are specific as to quantity, 9 use number or name classification, and 7 states do not specify sediment as to quantity.

One state requires full-can straining in place of the regular sediment test.

Fifteen of the states listed require sediment tests monthly; 4 states require semi-monthly testing and 6 states do not specify frequency of testing.

Ten of the states listed have established a minimum butterfat requirement for first grade or better.

Twelve of the states listed specify a specific price differential between one or more of the grades. In addition, one state specifies a price differential requirement without mentioning what it should be.

Eight of the states listed have a requirement for frequency of delivery from patron to the plant or station. In addition, one state practices the 4-Day Grading Program on a voluntary basis.

Twelve of the states listed require delivery from station to the plant in 48 hours or less. One state permits delivery twice weekly between October and April.

Twenty-seven of the states listed have some reference as to sanitation and condition of the shipping containers (producer cans) varying from a broad statement regarding sanitation to detailed requirements concerning rust, broken seams, and standard-type cans. In addition, 4 states prohibit the use of shipper cans for transporting whey, buttermilk or skim milk. One state merely recommends that the cans not be used for such purpose.

Twenty-one of the states listed have some requirements for farm conditions. Six of these have detailed specifications, one of which uses the Grade A Farm Score Sheet as a guide with a lower percentage of compliance than for Grade A.

As in the case of milk the line of distinction between the classification of *detail* and *general* was in some instances difficult and the decision was made arbitrarily.

Fourteen of the states listed require graders' license. In addition, 2 states require the licensing of field superintendents only.

Seventeen of the states listed require coloring of reject or unlawful cream. Twelve of these states require coloring by licensed graders, 4 by department inspectors or agents and one state specifies coloring of reject cream by authorized persons only. In addition, 4 states permit the coloring of reject cream by field superintendents or plant personnel.

Eleven of the states listed require segregation of the cream from time of purchase and prior to processing, on a grade basis.

Thirteen of the states listed require some station cooling of the cream, ranging from "cooling" to 75°F. Eighteen of the states listed have some truck or transportation requirements, ranging from use of wet blankets to enclosed and insulated trucks.

Four of the states require, recommend, or use whole-can straining for sediment and extraneous matter.

Two of the states listed require that producers submit a record of quality performance of their previous shipments when transferring from one company to another.

It it believed that this Committee should encourage the development and adoption of adequate uniform regulations governing milk and cream used for manufacturing purposes.

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REPORT OF THE COMMITTEE ON SANITARY PROCEDURE — 1956[1]

The Committee on Sanitary Procedure has participated in two joint-meetings of 3-A Sanitary Standards Committees since the 1955 Annual Meeting of this Association, in Augusta, Georgia. The first was held at the Georgian Hotel, Evanston, Illinois, November 7-9, 1955; the second at the Kenwood Golf and Country Club, Bethesda, Maryland, April 24-27, 1956.

The Evanston meeting was attended by eleven members of the Committee; the Bethesda meeting by twelve. Nine members attended both meetings. The Milk, Food, and Shellfish Sanitation Program of the U.S.P.H.S. was represented at Evanston by six staff members; at Bethesda by seven.

Although it may be claimed that the development of several needed sanitary standards, and the revision of one, have been materially advanced during the past twelve months, the only one which has been published is the revision of *3-A Sanitary Standards for Storage Tanks for Milk and Milk Products.* (Journal of Milk and Food Technology, June, 1956).

3-A Sanitary Standards for the Construction and Installation of High Temperature Short Time Pasteurizing System (161°F. or above, for at least 15 seconds), and *3-A Sanitary Standards for Milk and Milk Products Evaporators and Vacuum Pans,* have been approved in principle, have been subjected to editorial review, and are ready for publication. Still in the process of development are Sanitary Standards for Fillers and Sealers of Single Service Containers, for Separators, Standardizers, and Clarifiers, for Freezers of Ice Cream and Frozen Desserts, for Batch Pasteurizers, and for Rubber and Rubber-like Materials. And the revised form of *3-A Sanitary Standards for Holding and/or Cooling Tanks* has been considered at both meetings, and should be ready for final action at the December, 1956, meeting.

The recent Annual Reports of this Committee have been so restricted to announcement of accomplishments that readers probably have a vague and incomplete concept of the size of joint-meetings of 3-A Sanitary Standards Committees, the organization necessary in advance of and during meetings, and the mechanics by which agreements on the several provisions of completed sanitary standards are reached. The widening interest in 3-A Sanitary Standards, and the prestige they are acquiring – particularly with the application of the 3-A symbol to conforming equipment – make it highly desirable that members of this Association have some knowledge of those aspects of the formulation of 3-A Sanitary Standards.

Exclusive of DISA and NADEM staff members to register attendants and to attend to meeting room and eating arrangements, attendants numbered, respectively, 104 and 89 at the Evanston and Bethesda meetings.

A number of discussions of 3-A Sanitary Standards have appeared in the literature during the past five or more years, the latest, by John Marshall, having appeared in the July, 1956, number of the Journal. Nevertheless, just what the members of this Committee do, and how decisions are reached, and the types of problems encountered, have not been disclosed, except in generalities.

As Marshall and others have started, a tentative draft of sanitary standards is formulated by a Task Committee of fabricators, appointed for that purpose. The hypothetical course followed by such a tentative draft is from the Task Committee to the Sanitary Standards Subcommittee of D.I.C. (fabricators and users). The draft may have to be revised, reviewed, and shuttled back and forth several times. It is not supposed to be submitted to the sanitarians (this Committee and representatives of USPHS) until it is acceptable to fabricators and users (the Sanitary Standards Subcommittee of D.I.C.). Unfortunately, this course has not consistently been followed, because there are no interim meetings of the Sanitary Standards Subcommittee. Consequently, mimeographed tentative drafts of sanitary standards, discussed in generalities at a Sanitary Standards Subcommittee session of the last joint meeting, and revised in a subsequent Task Committee, may be submitted to the sanitarians and back to the S.S.S., simultaneously. This gets the cart before the horse, and considerable time and effort have been expended in comments on, and subsequent discussion of, provisions which members of the S.S.S. also did not approve. This has occurred several times in recent years, but steps have been taken to avoid these duplications.

Whatever be the history of tentative sanitary standards, when mimeographed copies are available, to be acted upon at a scheduled joint-meeting of 3-A Sanitary Standards Committees, they are distributed to the Committee members. For recent meetings, a deadline of six weeks prior to the date of the meeting has been fixed, when mimeographed drafts must be available for distribution. Members who do not plan to attend the meeting are requested to return comments and suggestions to the chairman, by a specified date. All

[1]Presented at the 43rd Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Seattle, Washington, September 5-7, 1956.

comments received are compiled, so as to be available for discussion at the caucus of Committee members and representatives of the USPHS, which invariably reaches agreement on the position to be taken on each provision of every sanitary standard before it is discussed in the joint-meeting with the S.S.S. and the Task Committee. It is this distribution of memeographed drafts of tentative sanitary standards to Committee members which accounts in the main for the annual postage bill of approximately $20.00, which appears in the Annual Report of our Executive Secretary.

The Committee on Sanitary Procedure consists of eighteen members. USPHS comments and views are obtained from approximately a dozen staff members. It is obvious that complete agreement among thirty individuals, concerned with different conditions in various geographical sections, would be extremely difficult to obtain by correspondence. It has, on occasion, been quite difficult to arrive at agreement among half that number of sanitarians sitting around a table. However, full discussion is essential to the development of sanitary standards which must cover all foreseeable conditions. Therefore, the sanitarians have several times met a day in advance of joint-meetings of 3-A Sanitary Standards Committees, in order to reach agreement on the changes to be requested in drafts. Either because of the number of tentative sanitary standards to be considered at a joint-meeting, or because of the differences in views of sanitarians and equipment fabricators (one of whom may be invited into the caucus to discuss a moot point), these caucuses frequently last until close to midnight. On a number of occasions, caucuses continued while the chairmen of the two groups presented to joint-sessions the views of the sanitarians on sanitary standards considered on the preceeding day or evening. Participants in recent meetings, now present in the audience, will testify that joint-meetings of 3-A Sanitary Standards Committees are anything but periods of relaxation.

In an effort to channel activities so as to expedite progress, an Executive Committee of the 3-A Sanitary Standards Committees has been formed. It is composed of two members from each of the participating groups. Ivan Parkin and the chairman are representatives of the Committee on Sanitary Procedure. By holding a meeting on the evening prior to the first day of the meeting, a breakfast meeting on the second and third days, and a session at the close of the meeting, the Executive Committee can be fully cognizant of the progress of every item of the agenda, and can reschedule sessions to avoid bottle-necks.

In approximately twelve years of these activities, considerable experience has been gained. It has been established that the development of drafts of sanitary standards can be expedited by detailing a member of the Committee to assist the Task Committee, with respect to the inclusion of provisions sanitarians will request, and also with respect to uniformity in the verbiage of provisions which also appear in sanitary standards already adopted. But it has also been demonstrated that, the delegation of the drafting of the final version of a sanitary standard to a small subcommittee, sometimes termed an *ad hoc* committee, is impractical.

One of the criticisms justifiably levelled against 3-A Sanitary Standards is the variety of text employed in succeeding sanitary standards to cover identical provisions. It is inconceivable that the verbiage employed in Sanitary Standards covering Storage Tanks for Milk and Milk Products, the first to be published, over eleven years ago, was so clear and concise that it could not be improved. Unfortunately, differing subsequent verbiage is not in all instances an improvement. There are also unaccountable variations in section titles, section numbering systems, etc. For instance: The 1946 version of Sanitary Standards for Storage Tanks prescribed that the outer shell "consists of a continuous metal covering which is smooth, sanitary, and water-proof". In the Sanitary Standards for Stainless Steel Automotive Transportation Tanks, the outer shell "shall consist of a continuous metal covering which shall be smooth and waterproof." In the 3-A Sanitary Standards for Holding and/or Cooling Tanks, it is prescribed that the outer shell "shall be of a continuous metal covering which is smooth, sanitary, and effectively sealed". In the revised 3-A Sanitary Standards for Storage Tanks, published less than three months ago, it is prescribed that the outer shell "shall consist of a continuous metal covering, or other waterproof material, which is smooth, durable, and effectively sealed." Here are four texts, pertaining to the same feature of tanks, in which the terms "smooth", "sanitary", "waterproof", "durable" and "effectively sealed" appear, but only "smooth" appears in all. In this instance it is obvious that the differences in text do not materially alter fabrication and inspection; and it must be conceded that "durable" and "effectively sealed" are improvements upon "sanitary" and "waterproof". Nevertheless, there are differences, and the best form of text should be selected and used in all subsequently formulated or revised standards.

These instances of non-uniformity are the result of: (*a*) lack of a fixed pattern, (*b*) failure of task committees to employ the best of the verbiage in sanitary standards already in print, and (*c*) failure of the signers of adopted drafts of sanitary standards to exercise their editorial prerogatives and responsibilities.

This lack and these failures do not fall into the category of non-feasances, but can readily be accounted for. The 3-A Sanitary Standards Committees

have been so fully occupied in the formulation of needed and demanded sanitary standards that no time has been available to devote to a fixed pattern. In many instances, members of task committees were undertaking an entirely new endeavor in drafting tentative standards, and probably assumed that conforming to the text of *any* sanitary standard assured a satisfactory degree of uniformity. When the mimeographed draft of an adopted sanitary standard, to the number of 15 to 20 copies, reaches the chairmen of the Committees for signature, it is rather late in the day to propose editorial changes.

As the list of 3-A Sanitary Standards grows in number, the task of unifying the texts of identical and parallel provisions, of the format, of the subtitling, etc., also becomes increasingly greater. The several different texts for identical or parallel provisions have been collated by Dr. John Barnhart, of the Dairy Industries Supply Association staff; but no organization has been perfected to select the most fitting and inclusive texts, nor has a movement been instituted to develop a fixed pattern for 3-A Sanitary Standards. However, these will assuredly eventually become projects in which members of this Committee will be called upon to participate actively.

Reference has been made in preceding Annual Reports to efforts to decentralize, so to speak, the activities of the Committee; that is, to acquaint like committees of Affiliate Associations with developments, and to make participation in the development of sanitary standards feasible. With a very few exceptions, results achieved have been unsatisfactory and discouraging. There is a race against time to distribute copies of tentative sanitary standards, and obtain comments, prior to scheduled joint-meetings. Extension of that activity would present serious problems in mechanics and finances. We have experimented with the plan of inviting representatives of affiliates in the vicinity of joint-meeting sites to attend the caucus sessions of the sanitarians, but this has not been encouraging. At the recent Bethesda joint-meeting, industry representatives were assessed a daily registration fee, the proceeds from which were applied to defrayment of the subsistence expenses of members of the Committee in attendance at personal expense. There not only are limitations to the accommodations available at the sites of joint-meetings, but such expense defrayment funds are also quite limited.

There is, however, one respect in which the Committee can widen the participation by Association members in its activities. The nature of provisions in tentative sanitary standards to be considered at a scheduled joint-meeting becomes known to the Committee at least six weeks prior to such meeting. In some instances, such as, for instance, sanitary standards for dairy farm milker pipelines, methods of cleaning and bactericidal treatment can not be completely divorced from consideration of details of installation.

Whenever, in the scheduled consideration of tentative sanitary standards, it becomes apparent that certain aspects of the proposed provisions fall within the field of activity of another Committee of this Association, the chairman should be authorized by the Executive Board to notify the chairman of the said Committee, to outline the proposal, and to invite him to detail a member of his Committee to attend the caucus of the sanitarians at the scheduled joint-meeting.

It should now be amply clear that membership on the Committee on Sanitary Procedure calls for activity which entails sacrifice of leisure, and sometimes personal expense – at least on the part of those members who attend joint-meetings of the 3-A Sanitary Standards Committees. It should also be evident that, aside from additional types of dairy equipment to be brought under the umbrella of 3-A Sanitary Standards, there are several projects for the improvement of 3-A Sanitary Standards which must be set in motion without continued delay.

Twelve of the sixteen active members of the Committee head up divisions of the Departments of Public Health or Agriculture by which they are employed. It must be assumed that, on occasion at least, they have assignments which take precedence over Committee activities. Members of the Association, and others, who are inclined to be critical concerning the rate at which 3-A Sanitary Standards are evolved or revised, and the variations (if noted) in their texts, should take these routine duties of three-fourths of the membership into consideration.

This Annual Report of an Association committee may justifiably be said to be quite unorthodox. It has intentionally taken this audience and readers behind the scenes, to acquaint them with the mechanics by which 3-A Sanitary Standards are formulated, the problems being met, the projects still to be undertaken, and reasons progress is no more rapid.

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H. C. Goslee
H. L. Thomasson
Paul Corash
Ben Luce
M. D. Howlett
John Culp
C. K. Luchterhand
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S. O. Holes
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W. Kempa

SUPPLEMENT TO ANNUAL REPORT

3-A SANITARY STANDARDS SYMBOL ADMINISTRATIVE COUNCIL

As stated in the 1955 Annual Report, the 3-A Sanitary Standards Symbol Administrative Council was organized late in April, 1956. Its function is to administer authorizations to apply the 3-A symbol to dairy equipment which conforms to 3-A Sanitary Standards. Four members of this Association — Paul Corash, Mark D. Howlett, Jr., Dr. K. G. Weckel, and the writer, represent the Association on the Council; three of the other members of the Council are also members of this Association.

The Council borrowed from this Association sufficient funds to remunerate its representatives for travel expense incurred in attending the organizational meeting of the Council. The Association also printed, on credit, the forms, stationery, etc., necessary for the Council to function. Subsequently, a supply of reprints of 3-A Sanitary Standards had to be obtained from the Association.

The total amount involved in the travel expense loan, printing, and reprints was $503.87. Prior to June 30, 1956, $103.87 was repaid, leaving the Council's indebtedness to the Association exactly $400.00.

Funds were also advanced by the Dairy Industries Supply Association, for operating reserve and attendance of members at the 1956 Bethesda meeting; so that the total indebtedness of the Council is precisely $1000.00. On August 31, 1956, however, the Council's bank balance, derived from application fees for authorization to use the 3-A Symbol, was $449.75, minus the August service charge, not yet received. Checks for $75.00 are undeposited because applications have not been fully processed. From April 6 to August 31, inclusive, 88 requests for application forms, instructions, etc., have been received, and 21 formal applications for authorization to use the 3-A symbol have been processed. Eighteen authorizations have been issued.

As the date of the Atlantic City Dairy Industries Exposition approaches, receipt of additional requests for forms, and of more formal applications, is anticipated, so that the Council should handily be able to meet the expenses of a meeting in December, and also further to reduce its indebtedness by the New Year.

Members of the Association should clearly understand and recognize that the processing of applications for authorization to use the 3-A symbol does not include an inspection of the equipment. The application form includes a declaration and affirmation that the models listed conform, in all respects, with the applicable 3-A Sanitary Standards; that the applicant has read and is acquainted with the rules of the Council (printed on the reverse of the application), and will abide by them; and will maintain, for the duration of the authorization, an organized system of inspection of finished units to which the 3-A symbol is attached. He also initials all of the paragraphs of the reprint of the 3-A Sanitary Standard to which his equipment conforms, and signs and submits the reprint with the application. Furthermore, he submits literature covering the equipment, describes the inspection system, and states how the symbol will be applied. Each authorization issue is covered by a complete file containing this data, and all correspondence.

It has never been the objective of those who conceived the 3-A symbol that its appearance on equipment should necessarily stop all interest in the degree to which it conforms to the pertinent 3-A Sanitary Standard. The conditions, above described, for issuance of authorizations to use the symbol do not completely obviate potentialities for instances of technical non-conformance, either in a detail of design, or of construction or finish which passed ineffective inspection. The impracticability of the establishment of a Council-controlled and directed inspection system, which could guarantee conformance with sanitary standards, is too obvious to warrant discussion. Therefore, there may be occasions on which regulatory sanitarians may note instances of apparent or suspected nonconformance by a unit of equipment bearing a 3-A symbol. Such instances should promptly be reported to the Secretary of the 3-A Symbol Council. Reports should include details, such as: type of equipment, model number, name and address of manufacturer, name and address of purchaser, date of purchase, and detailed coverage of the nature of the nonconformance. With this information, the matter can be investigated and handled in the manner set forth in the By-Laws of the 3-A Symbol Council. It is reiterated that only by making such reports detailed and complete can needless correspondence — and probably re-inspections — be avoided.

The 3-A Symbol Council is somewhat perturbed by indications that some regulatory sanitarians propose to adopt the policy that, after a specified date, only equipment to which the 3-A Symbol has been affixed may be installed within their jurisdictions. In the opinion of the Council, it is too early to impose such rulings, even if the question of their legality is waived. All of the potential problems arising in the administration of usage of the 3-A Symbol have not been encountered and solved, and situations may arise in which application of the policy of mandatory affixing of the 3-A Symbol may have embarrassing sequelae.

It *is* the function of regulatory sanitarians to assure themselves that new equipment conforms to sanitary standards, of which those known as 3-A are the current epitome. But, since the 3-A Symbol program has been envisioned and presented as a means of VOLUNTARILY indicating conformance to

sanitary standards, the application of pressure to force participation in the program subjects the sincerity of its proponents and sponsors — including this Association as an entity — to question.

It is urged that those contemplating policies of this nature reconsider the matter.

This report covers the initial phases of the consumation of a dream, indulged in by a number of individuals, for approximately ten years. Although the program was initiated as a project of this Association, it could not have been brought to the current stage of development without the collaboration of the users and fabricators of dairy equipment, and the financial support of the latter. This program will stand as another monument — 3-A Sanitary Standards being the first — to the exemplary relations being maintained between regulatory milk sanitarians and the Dairy Industry.

PUBLIC HEALTH ASPECTS OF FROZEN FOODS

REPORT OF THE COMMITTEE ON FROZEN FOOD SANITATION — 1956[1]

Since World War II the frozen food industry has been doubling its production about every four years. This rapid growth has been due largely to an increase in new products whose production and sales increased rapidly and then tended to level off. Frozen fruits and vegetables were the first group of commodities to expand rapidly, followed by the frozen juices and now the "heat and eat" items. The prospects are good that the "heat and eat" items — or prepared frozen foods, as they are known in the trade — will continue to be the most rapidly growing area in frozen foods in the immediate future. In 1952, approximately 50,000 dozen of frozen meat pies were sold, whereas in 1955 sales of this class of product had skyrocketed to 25,000,000 dozen.

There are several reasons for this continued expansion of frozen foods. In the first place, "heat and eat" items have opened the door for processors to shift the housewife's burden from the home to the factory. They provide a variety of convenient foods, and at the present time there are more than 200 of them on the market and more coming every day.

Undoubtedly many engaged in regulatory work pertaining to manufactured foods have been visited by many persons wishing to find out what laws and regulations exist which govern the manufacture of frozen food items. Most of these persons wish to prepare the foods in their home kitchen, package them, and freeze them in their home freezer at the start to "see how they will go." This is, of course, a direct violation of the sanitary food laws in most states, and we are able to dissuade many of these people from entering this phase of the food business on a "shoestring." However, for every person who visits a regulatory agency, there are probably a half dozen who do enter the business without consulting anyone. Certainly there is a potential public health hazard when persons with little or no experience in quantity production of food, and who have little or no conception of sanitation, sterilization, or preservation, enter any type of food business.

There are also problems connected with established companies entering the frozen food field. For many years the food preservation industry has used heat sterilization to preserve perishable foods. Any bacterial contamination which finds its way into a product, either through accident or carelessness of food handlers, is killed by the heat processing methods used in the canning industry, and in practically all cases this provides a sterile product. While the industry is becoming more and more sanitation conscious, in some cases processors are not as conscious of bacterial contamination of product as they should be. Some processors have become conditioned by many years experience to rectifying their errors in sanitation by sterilization of the finished product. When these operators enter the frozen food field, they tend to follow the same pattern, not realizing that the saving grace of heat sterilization is not present in their new operation.

There is a popular misconception that freezing kills bacteria, and it is true that many strains of bacteria are killed by freezing. However, it is also true that many bacteria when exposed to freezing merely go into a dormant state and hibernate until more favorable temperature conditions occur, at which time these bacteria resume their normal living habits. In fact, it is common practice in laboratories today to preserve cultures of many strains of bacteria by a freezing-drying method. Unfortunately, many of the pathogenic organisms will withstand freezing, and therefore frozen foods which have been contaminated with certain pathogens during manufacture are potentially dangerous.

It was felt that since there is a potential danger in

[1]Presented at the 43rd Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., at Seattle, Washington, September 5-7, 1956.

this type of food, some steps should be taken to gather information to determine whether or not a public health problem exists. As a result, numerous samples of prepared frozen foods were obtained for laboratory examination. Most of the samples were purchased in retail stores. A few were procured at factories producing this type of product at the time of sanitary inspections of the plant. The laboratory results are summarized in Table 1. Out of twenty samples, six were positive for the coliform group, while paracolons were isolated from four samples. *Proteus mirabilis* was isolated from one sample. It is realized that no known pathogenic organisms were found in this sampling, but certainly the presence of coliforms, paracolons, and *Proteus mirabilis* is considered an indication of possible fecal contamination. It may be noted that most of the samples are chicken or turkey products. During inspections of plants producing similar products, practices were observed that could lead to this type of contamination. A typical manufacturing procedure for producing chicken and turkey pot pies is as follows:

1. Chickens and vegetable ingredients are delivered to the plant frozen and are stored in a freezer until use. Immediately prior to use, the frozen birds and vegetables are thawed by immersing in large vats of water.
2. After thawing, the birds are placed in perforated metal baskets (retort crates) and lowered into a retort where they are cooked under 12 to 14 pounds pressure (240°F.) for approximately 40 minutes.
3. After cooking, the baskets are lifted from the retort and placed in a large tank of running water and remain in this water tank until they reach a temperature of approximately 60°F. The birds are then removed from the water and taken to the boning tables. The women boning the meat had been provided with rubber gloves of which the thumb, index, and middle fingers were metal mesh – similar to those used by ham boners in meat packing plants. The use of plain rubber gloves has not proven suitable since the women could not pull the meat from the bone.
4. After boning, the meat is taken to an inspection

TABLE 1 – RESULTS OF LABORATORY EXAMINATION OF CERTAIN PREPARED FROZEN FOODS

Product	Plate count (per gm)	Coliform group	Pathogenic enteric group	Organism isolated
Chicken pot pie	920,000	+	–	
Chicken pot pie	620,000	+	–	Paracolon group
Beef pot pie	500,000	+	–	
Diced cooked chicken	3,000,000	+	–	*Proteus mirabilis*
Chicken dinner	–––	–	–	
Chicken dinner	300	–	–	
Chicken dinner	1,800	–	–	
Chicken dinner	710	–	–	
Chicken dinner	600	–	–	
Chicken dinner	38,000	–	–	Paracolon group
Turkey dinner	12,000	–	–	
Turkey pot pie	20,000	+	–	
Turkey pot pie	100,000	+	–	
Turkey pot pie	–––	–	–	Paracolon group
Turkey pot pie	–––	–	–	Paracolon group
Swiss steak dinner	7,500	–	–	
Chicken and noodles	10,000	–	–	
Chicken and noodles	20,000	–	–	
Chicken and dressing	16,000	–	–	
Chicken and dressing	11,000	–	–	

TABLE 2 — RESULTS OF LABORATORY EXAMINATION OF SAMPLES TAKEN FROM CHICKEN POT PIE PRODUCTION LINE

Product	Plate count (4 days at 32°C.) (per gm)	Salmonella Shigella group	Coliform group	Coliform count (24 hrs. at 35°C.) (per gm)
Chicken meat after cooking	280	—	—	0
Chicken meat after dicing	450,000	—	+	1,600
Chicken meat prior to filling	1,100,000	—	+	3,600
Gravy from cooking kettle	300	—	—	0
Gravy from filling line	920	—	+	70

table and spread in a thin layer on the table, to enable removal of any small bones or gristle left in the meat by the boners. The inspectors did not wear gloves and handled each piece of meat. The use of rubber gloves by the inspectors had been tried but the women could not feel the bones and gristle while wearing them.

5. After inspection, the meat is removed to a dicing table where it is diced by hand by use of small cleavers. The women performing the dicing operation wear the same type of glove used by the women in the boning operation.
6. The diced meat is placed in a freezer for one hour to quickly chill it, after which it is removed from the freezer and placed in a cooler at a temperature of 34°F. until needed.
7. The broth in which the chickens are cooked is pumped to the gravy kettle where the defrosted vegetable ingredients are added along with starch, monosodium glutamate, and the seasonings. The gravy (the mixture of broth, vegetable ingredients, starch, monosodium glutamate, and seasoning) is cooked to a temperature of 205°F. with constant agitation.
8. After the gravy is cooked, it is pumped through a five-stage autodyne — the first two stages being cooled by circulating well water, the last three stages being cooled by ammonia. From the autodyne, the gravy is pumped to a receiving tank at the pie production line.
9. The dough is mixed, divided, and rolled by the same method used in most pie bakeries. A sheet of dough is placed in the bottom of an aluminum pie pan on the conveyor belt.
10. The gravy is automatically measured into each individual pie as it passes beneath the dispenser. Women then add the diced chicken meat on top of the gravy in each pie. This is done by hand. A sheet of dough is then placed on top of the pie and the dough crimped and cut by machine.
11. Pies are then boxed in an automatic boxing machine, packed twelve to a carton, and taken to the freezer.

In an effort to identify the sources and routes of contamination in the finished product, several samples were taken from a plant processing line. A sample of chicken meat was taken immediately after cooking and before the cooling operation. A second sample of chicken meat was taken immediately after the dicing operation, and a third sample of chicken meat was taken at the point of the filling operation. In addition, a sample of gravy was taken from the cooking kettle upon completion of the cooking operation, while a second sample of gravy was taken at the filling line as it was being filled into the pies. The results of the laboratory examination of these samples are summarized in Table 2. It may be noted that immediately after cooking, the total plate count was only 280 per gram, and the coliform count was zero. After three hand operations (boning, inspection, and dicing), the total plate count had risen to 450,000 per gram and the coliform count was 1600 per gram. The sample of chicken meat taken immediately prior to adding the meat to the completed pie gave a total plate count of 1,100,000 per gram and the coliform count was 3,600 per gram. From this it appears that the material was grossly contaminated during the boning, inspection, and dicing operations. Since approximately a six-hour interval occurs between the dicing operation and the actual filling of the meat into the pies, the organisms present may have an opportunity to multiply even though kept under refrigeration. The gravy from the cooking kettle had a total plate count of 300 per gram, and a coliform count of zero; gravy from

the filling line had a total plate count of 920 per gram and a coliform count of 70 per gram. Since very little time elapses between the cooking operation and the filling operation, the increase noted is probably attributable to improper cleaning of the lines conveying the gravy from the cooking kettle to the filling line.

It is believed that certain definite conclusions can be reached after reviewing the manufacturing procedure together with the laboratory results.

1. The meat contains relatively few organisms immediately after cooking.
2. The meat can be readily contaminated with coliforms, paracolons, and other enteric organisms during the boning, inspection, and dicing operations.
3. Even though the meat is stored under refrigerated conditions during the time between the dicing operation and the actual filling, growth of organisms occurs.
4. The meat is not heated or cooked after the boning, inspection, or dicing operations.
5. Freezing may not kill the organisms present. It is probable that many remain viable.
6. The presence of coliforms, paracolons, and other members of the gram negative enteric group of organisms is strongly indicative of contamination from fecal sources, and of uncleanly habits of personnel boning, inspecting, and dicing the meat.

In the light of these conclusions, it is felt that we have been very fortunate there have been no reported outbreaks caused by this class of food. These products carry cooking directions on the label. The label on frozen pot pies for example, indicates the pie should be placed in a 350°F. oven until the crust is brown. This undoubtedly heats the product to a temperature lethal to enteric organisms and is probably the "saving grace" in preventing serious outbreaks. It is conceivable, however, that a disease carrying employee doing the boning, inspecting, or dicing of the meat, could contaminate the product with pathogenic organisms; if a housewife who has purchased several of the pot pies prepared from this contaminated material made the mistake of placing the pies in a 500°F. oven which could result in browning of the crust before there was sufficient heat penetration to kill the pathogens, it is certainly possible that illness could result. These are assumptions, but practically all food poisoning outbreaks are caused by an unusual chain of events.

It is the opinion of the Committee that this is a potentially hazardous situation needing further attention and action by public health sanitarians. There is need for improved sanitary conditions in the boning, inspection, and dicing operations, and especially for pasteurization or sterilization of the product before filling. Seemingly, the meat ingredient, after dicing, could be added to the gravy during the last ten or fifteen minutes of cooking time, and the load of visable organisms greatly reduced if not totally eliminated.

The Committee has not proposed a tolerance for total plate count for this type of material since it is felt that the contamination of these products by coliforms, paracolons, and other members of the gram negative enteric group of organisms is of greater importance. If the coliform test is to be used as an index of quality, then the only acceptable tolerance would be zero. There is need for further consideration of the problem of possible preformed staphylococcus enterotoxin in such food material; a laboratory study of this problem was not made. Because of the high total plate counts found in some of these products, it is possible some staphylococcus organisms were present including strains of staphylococci capable of producing enterotoxin. Improper handling of the product containing such staphylococci during manufacture, storage or distribution, and involving exposure to temperatures such as to enable its thawing could result in production of enterotoxin.

The Committee recommends that additional study be made of the sanitary quality of this type of product. Because the results of this study indicate occurrence of high total bacteria counts, and of the presence of organisms of the coliform, paracolon, and other members of the gram negative enteric group, in the finished product, further investigation of the practices in the industry, and of the product should be made.

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NEWS AND EVENTS

DR. CARL R. FELLERS UNIVERSITY OF MASSACHUSETTS RETIRES

Amherst, March 8 — The retirement of Dr. Carl R. Fellers, head of the food technology department at the University of Massachusetts for 16 years, was announced by President J. Paul Mather today. Dr. Fellers' retirement in July, 1957 will mark the completion of over 30 years service at the state university.

Prof. Fellers graduated from Cornell University in 1915, and holds the M.S. and Ph.D. degrees from Rutgers University. Before joining the University staff in 1925, he taught at the University of Washington, and has since acted as bacteriologist for the U.S. Bureau of Chemistry and Soils.

Dr. Fellers was engaged by the National Canners Association as a technologist, and during World War II he had charge of food inspection and procurement activities in Australia for the Army. He has also served as Commanding Officer of the 1224th Research and Development Unit of Springfield, Mass.

A recipient of the Babcock Award of the American Institute of Nutrition, Prof. Fellers was president of the Institute of Food Technologists in 1949, and served as chairman of the Agricultural and Food Division of the American Chemical Society in the same year.

He is a member of numerous professional and learned societies and has published over 200 scientific and technical papers in his field. As head of the U. of M. food technology department, he has had charge of the 35-40 graduate students who come annually from all parts of the world to study at the University.

DR. STUART PATTON RECEIVES BORDEN AWARD IN MILK CHEMISTRY

Dr. Stuart Patton, associate professor of dairy science at The Pennsylvania State University, received the $1,000 Borden Award in the Chemistry of Milk at Miami, Fla., on Monday evening, April 8,

during the 131st national meeting of the American Chemical Society.

The presentation took place at a general session of the Society at the Band Shell in Bayfront Park, according to Dr. Roger J. Williams, president of the Society and director of the Biological Institute of the University of Texas. The Society, which administers the award, convened April 7 through 12.

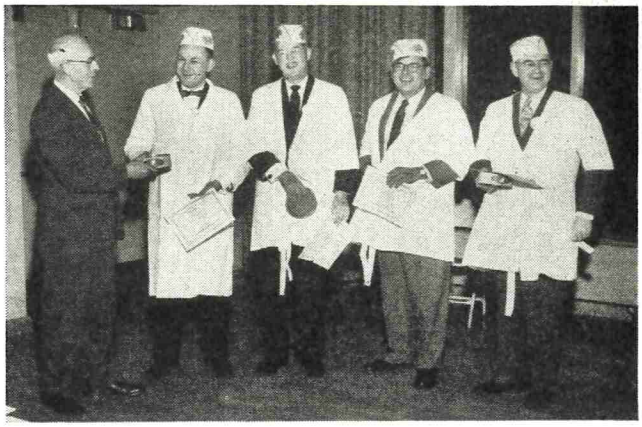
Dr. Patton has done outstanding work in the field of dairy chemistry, especially on the identification and method of formation of objectionably flavored compounds in dairy products. His diversified research includes studies of heat-induced flavors in milk, the manufacture of butter-oil, and the color changes in evaporated milk. He is the author or co-author of 49 technical papers and has recently expanded his research to cover the effects of radiation on milk and milk products.

The Borden Award, consisting of a gold medal and the cash prize, is sponsored by the Borden Company Foundation, Inc., New York, and is given annually to "recognize and encourage outstanding research achievements in the chemistry of milk in the United States and Canada."

Dr. Patton was born in Erie County, N. Y., in 1920 and received B. S. degree from Penn State in 1943 and the Ph. D. from Ohio State University in 1948. He was employed in the Special Products Division of the Borden Company during 1943 and 1944, after which he served for two years in the U. S. Navy, most of the time as an officer in the Pacific area. In 1949 he became assistant professor of dairy science at Penn State. He was promoted to associate professor in 1952.

An active member of the graduate school faculty at the University, he directs the research programs of from three to six graduate students yearly and has systemized the programs of graduate students for the Department of Dairy Science. For a number of years he has directed research sponsored by the Quartermaster Food and Container Institute for the Armed Forces. He has obtained patents for methods of extracting pure milk fat and of simulating the flavor of bleu cheese.

Dr. Patton is a member of the American Chemical Society and has been for several years an abstractor for the American Dairy Science Association. He presented his award address, entitled "Organic Chemical Effects of Heat on Milk," before the ACS Division of Agricultural and Food Chemistry on Monday afternoon, April 8, in the Shelborne Hotel, Miami.



Left to right: Dr. H. A. Bendieem during banquet presents honorary Institute degrees to Harold. Wainess, Chicago; Dr. E. L. Jack, U. of California; Dr. H. E. Calbert, U. of Wisconsin; Dr. R. E. Hodgson, USDA, Washington, D.C.

26TH ANNUAL INSTITUTE OF DAIRYING

Approximately 200 Pacific Northwest dairymen attending the 26th annual Institute of Dairying at the State College of Washington in Pullman, Washington, delved into many of the dairy industry's current problems, discussed modern trends in processing and merchandising and heard about the latest research findings in new products development, quality control, and operating efficiency. They listened to 25 guest speakers from Washington, Oregon, California, Idaho, Wisconsin, Iowa, Illinois, Maryland and Washington, D. C. and participated in quality clinics of dairy products entered in a national scoring contest. A total of 222 samples of butter, cheddar cheese, cottage cheese and vanilla, chocolate and strawberry ice cream competed for honors, awards and diplomas of merit in this contest. Winners in the contests are listed below.

Out of the state speakers included Dr. H. E. Calbert of the University of Wisconsin; Dr. E. L. Jack of the University of California; Harold Wainess, Consultant on Sanitary Science of Chicago; Dr. R. E. Hodgson, Director, Animal Husbandry Division, Agricultural Research Service, Beltsville, Maryland; Walter Ahlstrom of the Carnation Company, Los Angeles; H. E. Behlmer, Cherry-Burrell Corporation, Cedar Rapids, Iowa; D. R. Strobel, Foreign Agricultural Service, US DA, Washington, D. C.; Dr. T. K. Cleveland, Vice-President, Research and Development, Philadelphia Quartz Company, Berkeley, California; H. L. Forest, Director of the Dairy Division, A.M.S., Washington, D. C., Leroy S. Houser, Regional Milk & Food Consultant, U. S. Public Health Service, San Francisco, California; D. H. Williams, Dairy Technologist, International Association of Ice Cream Manufacturers, Washington, D. C.; Vaughn Anderson, Director, Division of Engineering and Sanitation, Idaho State Board of Health, Boise, Idaho; George Armerding,

Mojonnier Bros. Company, Oakland, California; Kenneth E. Carl, Division of Foods & Dairies, Department of Agriculture, Salem, Oregon.

Dr. Calbert discussed the potentialities of new and improved dairy products, such as fresh and frozen concentrated milk, powered milk, cultured cream and other by-products. He also presented new developments in the control of antibiotics and other quality factors. Automation in dairy plants and latest developments in plant equipment such as automatic case stackers and unstackers, high heat pasteurizers, vacuum equipment for the removal of off-flavors from milk and cream were covered by Mr. Armerding, Dr. Jack, Mr. Behlmer and Mr. Wainess. The latter also dealt with new plastic containers, vending machines and controlling pasteurization efficiency. Other speakers brought out new opportunities in the development of foreign markets, merchandising programs, waste disposal, protection of water supplies, price programs, improved operating efficiency.

The Washington Milk Sanitarians Association held their annual meeting presenting committee reports and listening to Prof. Oliver H. Johnson of the State College of Washington speak of his experience in Israel as regards Dairying and Dairy Sanitation in that country.

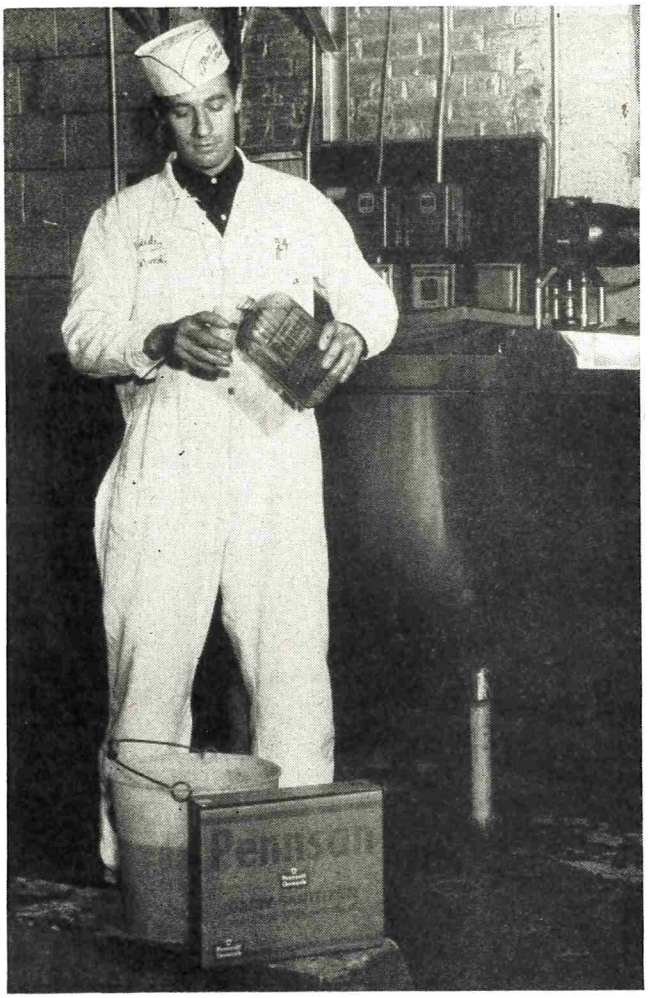
NEW TYPE NON-CORROSIVE SANITIZER FOR STAINLESS STEEL TANKS DEVELOPED BY PENNSALT

Pennsalt Chemicals has developed an entirely new type of sanitation for stainless steel tanks in a new product called PENNSAN. A unique sanitizer with cleaning properties, PENNSAN was created in answer to the need for a non-corrosive compound designed especially for bulk farm tanks, tank trucks and CIP lines.

Pioneers in dairy sanitation, Pennsalt conducted extensive laboratory and field tests to create in PENNSAN a sanitizer which can be used in all waters at all operating temperatures without danger of corrosion or discoloration to metal. PENNSAN is a completely soluble, liquid bactericide with cleaning action which controls the formation of milkstone and keeps stainless steel tanks bright and new looking.

For further effectiveness, a PENNSAN test kit has been designed and made available at nominal cost to promote maximum utilization at lowest cost in the application of this most advanced product for modern dairy sanitation.

PENNSAN is available in handy half-gallon containers packed eight to a carton. Individual packages hold two half-gallons of PENNSAN and a free polyethylene cup for measuring.



Details on the use of PENNSAN in bulk farm tanks, tank trucks and CIP lines are available from distributors or the manufacturer: B-K Department P, Pennsalt Chemicals, 3 Penn Center Plaza, Phila., 2, Pa.

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140 SUPPLIERS-EQUIPPERS IN ATTENDANCE AT DISA'S 38TH ANNUAL MEETING

Approximately 140 registrants from every section of the United States registered for the 38th Annual Meeting of Dairy Industries Supply Association, March 14-15 at the Shoreham Hotel in Washington, D. C.

A one and one-half day event-packed meeting was planned by DISA's Annual Meeting Committee, headed by John A. Miller, Chester-Jensen Company, and comprised of A. C. Beall, C. M. Pitt and Sons Co.; Ernest Capelle, Taylor Instrument Companies; Nelson L. Ellis, Eastern Stainless Steel Co.; N. D. Grasty, Crown Cork and Seal Company; and Louis V. Towt, McCormick and Company.

Variety was the keynote of the program, according to Chairman Miller. A dramatic skit was presented to emphasize hotel problems which members might en-

counter during a dairy industries convention or Exposition (DSIA sponsors the Dairy Industries Exposition every two years). A panel with numerous slide presentations discussed most advanced thinking in trade show design. Top flight speakers from industry, government and the professions addressed the sessions. And regular DISA business, including election of six directors and officers for the coming year, was attended to.

John C. Davis, American Seal-Kap Corp., who serves as Chairman of DISA's Hotel Committee, led a discussion following presentation of the dramatic skit on hotel problems. The panel on display effectiveness at trade shows was moderated by Ray M. Martin, Kelvinator Division of American Motors Corp., who also serves as Chairman of the Exposition Floor Committee. Mr. Martin was assisted by D. W. Derber, R. F. Dorrell and L. A. Douglass, all three of whom are affiliated with divisions of United States Steel Corporation, and Dr. J. E. Batchelder, Director of the Industrial Advertising Research Institute.

From the business world, Richard J. Speirs, President of Abbotts Dairies, Inc., Philadelphia, discussed "Dairy Processor Problems." Representing the Eisenhower Administration, Governor Howard Pyle, Deputy Assistant to the President, described "Washington Today." And representing the professions, the popular Reverend Laurence H. Hall, Rector of St. Paul's Episcopal Church, East Cleveland, Ohio, revealed "America's Secret Weapon, Humor," in an inspirational address, the second time in as many years he has been asked to address a DISA meeting.

A panel of supplier-equipper volunteers who had assisted Dairy Society International in presenting dairy educational displays in international trade fairs in Europe, Asia and Latin America in the past year discussed their experiences in this regard. Participating were T. A. Burress, The Heil Co.; Peter Olsen, The Olsen Publishing Company; Roger J. Sharkey, Ex-Cell-O Corporation, Pure-Pak Division,; John C. Taber, American Milk Review; and a report was recognized, in absentia, from Gordon Lamont, a DISA past president and frequent volunteer in international undertakings.

A review of data being considered by the Dairywide Coordinating Committee on Nutrition Research, covering a possible connection between fat in the diet and heart disease, was presented by Robert Rosenbaum, David Michael & Co.

F. M. King, Wyandotte Chemicals Corporation, who serves as Chairman of DISA's Customer Association Relations Committee, unveiled a new publication of his committee designed to assist suppliers-equippers in evaluating requests for financial support from various groups of customers.

FIRST MOBILIZATION OF FEDERAL CIVIL DEFENSE PLAN

First mobilization of the dairies of the country under the Federal Civil Defense plan to save lives during disaster by providing packaged drinking water to flood-displaced families drew praise today from relief officials in the recent Tri-State diseaster areas of eastern Kentucky, Virginia and West Virginia.

When the record-breaking floods of January 29 rolled over 31 counties in the three states, municipal reservoirs and rural wells of more than ten thousand families were polluted. Within the next few hours the huge dairy tank trucks and trailer vans were brought into action to transport pure drinking water which the dairies had packaged into milk cartons, to insure complete sanitation on its way to the distressed families. The same machines which package bulk milk into half-gallon cartons were pressed into action to package fresh drinking water in half-gallon sealed containers. Thousands of gallons of fresh water also was delivered in bulk by dairy tank trucks to hard-hit flood disaster areas where Red Cross and other relief agencies supervised its distribution.

In the interval between the crest of the flood and the receding of the flood waters, power systems were knocked out in the 31 counties in the Tri-State area which President Eisenhower, on recommendations of the Administrators, Federal Civil Defense engineers declared to be major disaster areas and thereby eligible for Federal assistance for temporary repairs to damaged or destroyed public facilities. Without power or fuel, thousands of unfortunate families for hours could not boil the available water. For them the arrival of the packaged fresh water proved to be a safeguard against epidemic and infections which often follow floods.

The January 29 floods in Kentucky, Virginia and West Virginia provided the first opportunity to test the effectiveness of the plan in an actual emergency. Perry County CD Director Hahn said Hazard, Kentucky, flood victims would have been in "serious danger without packaged drinking water."

Cooperating with FCDA in developing the emergency program were the American National Red Cross, the Department of Health, Education and Welfare, U. S. Public Health Service, Milk Industry Foundation, Dairy Industries Supply Association, Milk Carton Quality Performing Council, American Can Company, Pure-Pak Division of Ex-Cell-O Corporation, Sealright Company, The Michigan Milk Dealers Association, Dairypak, Inc., The International Paper Company, Fibreboard Products, Inc., and the Kieckhefer Container Company.

At the request of the FCDA, officials of the U. S. Public Health Service surveyed the Tri-State disaster

area and reported today that 59,025 gallons of pure drinking water had been made available from eight plants of four different dairy companies in Kentucky, Virginia, West Virginia and Tennessee. Their tank trucks and trailers rushed the packaged and bulk drinking water to eight communities in Kentucky, Virginia and West Virginia.

Dairies which participated in the emergency plan set up by Federal Civil Defense were the Borden Dairy Products, of Huntington, W. Va., Pet Dairy Products Co., of Big Stone Gap, Va., Kingsport and Johnson City, Penn., Chappel Dairy Products, of Campbellsville and Foremost Dairy Products of Bristol, Va., Kingsport, Tenn., and Welch, W. Va. Their over-all total of nearly 60,000 gallons of drinking water was rushed to Pikeville and Hazard in Kentucky; to Logan, W. Va., and to Pound, Haysi, St. Paul and Clinchport in Virginia, according to a survey released by the Tri-State disaster headquarters of Federal Civil Defense, located at London, Ky.

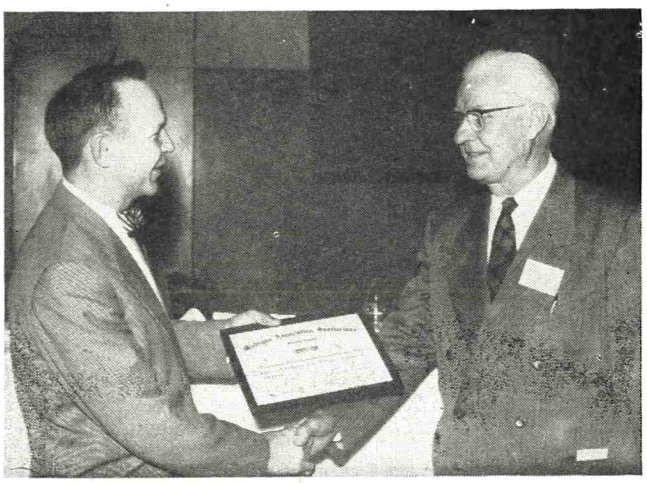
The plan to use drinking water packaged in milk containers to aid a helpless community was introduced at Stroudsburg, Pennsylvania, in August, 1955, when that city was flooded by the torrential rains of Hurricane Diane. With the Stroudsburg milk plant put out of action, an appeal for milk cartons to be used as water containers was sent to the Lehigh Valley Cooperative Farmers Dairy at Allentown, thirty miles away. The Allentown Dairy not only sent the cartons, but filled them with water to avoid contamination that might have resulted from manual handling in Stroudsburg. The filled cartons were trucked to Stroudsburg and distributed to flood victims. It was credited with having helped to prevent the outbreak of epidemics.

THIRTEENTH ANNUAL MEETING MICHIGAN ASSOCIATION OF SANITARIANS

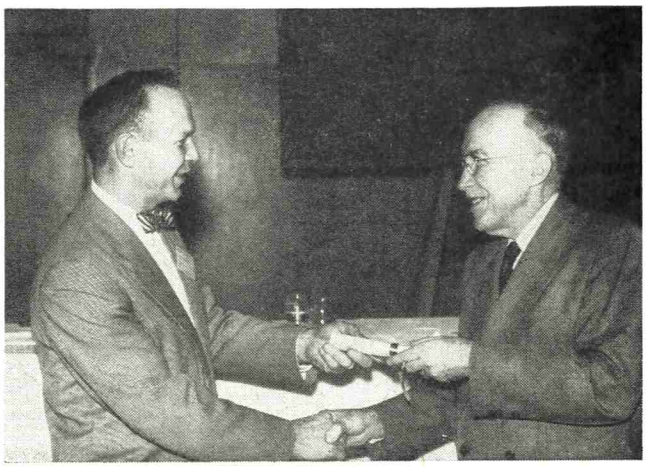
The thirteenth annual meeting of the Michigan Association of Sanitarians was held at Kellogg Center, Michigan State University, on April 15, 16 and 17th.

The meeting was attended by nearly 300 persons and the twenty-six speakers presented a program which covered nearly every field of environmental sanitation.

The banquet, held the evening of the 16th, was the occasion for the presentation of life membership awards to Dr. W. L. Mallmann, Dept. of Microbiology and Public Health and to Professor Paul S. Lucas of the Dairy Department, both of Michigan State University. The awards were made in recognition of the years of service which these two men have given to the association and to the general field of environmental sanitation.



Retiring president, Dr. Clyde K. Smith presents the Michigan Association's Life Membership Award to Professor Paul S. Lucas, Dairy Dept. M.S.U.



Retiring president, Dr. Clyde K. Smith presents the Michigan Association's Service Award to Kenneth Kerr, of the Grand Rapids Health Department.

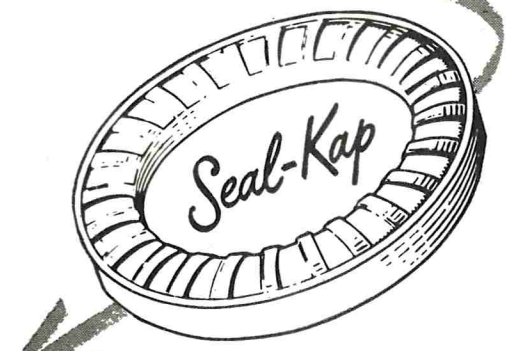
The sanitarians' award was presented to Kenneth Kerr of the Grand Rapids Health Department, a veteran of nearly twenty-five years with that department, for his service to the association.

At the business meeting, the following officers were elected for the ensuing year.

HOMER N. CALVER APPOINTED VISITING PROFESSOR AT AMERICAN UNIVERSITY OF BEIRUT

Homer N. Calver, Secretary of the Public Health Committee of the Paper Cup and Container Institute, has been granted a leave of absence to accept an invitation from the American University of Beirut, Lebanon, to serve as Visiting Professor of Public Health this summer.

and



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CONNECTICUT ASSOCIATION MEETINGS

The Connecticut Association of Dairy and Food Sanitarians, Incorporated, wishes to announce two coming events which will be of interest to your readers.

The first event is a Spring Meeting of the Connecticut Association of Dairy and Food Sanitarians and the University of Connecticut, College of Agriculture on May 21 and 22 at the University. Northeastern Dairy Flavors Symposium will be discussed. The meeting begins at 9:30 a.m. on the twenty-first.

The second event is the Annual Outing of the Connecticut Dairy and Food Sanitarians on Wednesday, September 11, at the Torrington Country Club in Torrington, Connecticut. This will be an all-day affair.

DISA TECHNICAL HEAD MOVES TO IDAHO UNIVERSITY, HIS SUCCESSOR TO BE NAMED SOON

Dr. John L. Barnhart, Technical Director of Dairy Industries Supply Association, Washington, D.C., has accepted an appointment as head of Dairy Manufacturing at the University of Idaho in Moscow, Idaho. He will leave Washington in early May, and will be joined by his wife and three children in Moscow in the early summer months.

A successor to his post on the staff of Dairy Industries Supply Association will shortly be announced.

Dr. Barnhart joined DISA as Technical Director in 1953, and quickly became immersed in activities of the DISA Technical Committee which affords supplier-equipper representation in the work of the 3-A Sanitary Standards Committee.

While engaged in 3-A activity, Dr. Barnhart recognized the need of a research project which will study the effect of cleansing agents and dairy products upon the surfaces of dairy metals and other metallic substances and plastics used in direct contact with dairy products. He hopes to initiate research work in this field at his new post.

DISA assignments called upon Dr. Barnhart to consult on a wide variety of technical subjects which directly affected the welfare of dairy industrial suppliers-equippers, and allowed him to serve in an industry-strengthening role on committees and special assignments of numerous dairy industry bodies.

Some of this all-industry work will be continued by Dr. Barnhart, it is explained. He has been active on the Education and Training Subcommittee and the Sanitary Standards Subcommittee of Dairy Industry Committee, and he hopes to pursue these interests.

Dr. Barnhart also devoted many hours to counseling Dairy Society International in that group's work in staging dairy industrial exhibits in trade fairs abroad; and he undertook an on-the-spot survey in Puerto Rico for the Society, as a prelude to the construction and operation of the island's first dairy by-products plant.

A Colonel in the Air Force Reserve, Dr. Barnhart served as Group Commander of the Washington Air Reserve Center, which encompasses areas in southern Maryland and northern Virginia, as well as the District of Columbia. Col. Barnhart also was Chairman of the Air Explorers Committee for the Washington area.

Prior to joining DISA in 1954, Dr. Barnhart was Director of Science and Professor of Dairy Manufacturing at Temple University. Earlier posts in his teaching career included universities in Pennsylvania, Kansas, Oklahoma and West Virginia.

DAIRYMEN OBSERVE 350TH BIRTHDAY JUNE 4 WITH PROGRAM AT JAMESTOWN

Tuesday, June 4, has been set as the dairy industry's official 350th birthday party date, it was announced this week by Merrill N. Warnick, Pleasant Grove, Utah, chairman of the industry's anniversary celebration.

Dairymen representing all phases of the industry will assemble at the site of Jamestown colony in Virginia for special ceremonies June 4. The Honorable Thomas B. Stanley, a Virginia dairyman and governor of the state, will participate in the anniversary event.

Beginning at 11:00 a.m., the ceremonies will feature a history of the American dairy industry, which began as an import business May 13, 1607, when the first English settlers arrived at Jamestown. Following this a representative of the British dairy industry will present to Governor Stanley four purebred English calves which are being shipped to Jamestown by the English dairymen as part of the commemoration of the beginning of the dairy industry in this country.

Governor Stanley will present the calves to four regional winners in a contest being conducted by the national 4-H groups to select outstanding dairy project youths. The boys and girls who receive the calves will have the option of adding them to their family herds or auctioning them off to add to their funds for future education. Announcement of the 4-H winners will be made following their selection May 20. Each state has been asked to nominate one outstanding dairy project youth from which the four regional winners will be selected.

Governor Stanley will also speak following the presentation on the subject of what the dairy industry means to America today. The event will close with a luncheon in Williamsburg, Virginia.

Secretary of Agriculture Ezra Taft Benson has indicated he will attend the special ceremony if he arrives back from a foreign trip in time. The guest list is also expected to include a wide range of government and state dignitaries as well as dairy industry representatives.

INDUSTRY MUST "SELL ITSELF" TO ATTRACT TOP MEN, MIF SPOKESMAN SAYS

The need for the dairy industry to start "selling itself" in order to attract and hold its quota of high caliber young men was emphasized today by Perry R. Ellsworth, of the Milk Industry Foundation, speaking here today before the Dairy Industry Conference at the University of California.

"It is up to the plant or dairy company to make processing work interesting and rewarding enough to get and hold the college graduate," said Ellsworth, who is assistant to the executive director of the MIF.

"Our first problem is to recruit the boy," he stressed. "We must reach the high school student before he graduates with his mind all made up to study engineering and tell him the story of the dairy processing industry."

Ellsworth stated that "industry can aid greatly by either providing individual company scholarships or by jointly contributing to scholarship funds for the use of the dairy manufacturing departments of their state universities.

"University curricula in dairy manufacturing are being changed to fit today's needs. As a result of the work of the Education and Training Sub-committee of the Dairy Industry Committee and the Educational Committee of the American Dairy Science Association, curricula are being designed that will do the job of providing the training that industry wants to see its prospective employees receive. Most of these study plans require the students to work in a dairy plant during at least two summers.

"The graduate who has invested four years in learning about the dairy processing industry . . . wants more than a lot of us feel able to pay, but," warned Ellsworth, "he can go to another field, even with his dairy training, and get that salary.

"This graduate wants as good working conditions as possible and a fair share of time off . . . use of his full abilities . . . promotions and pay raises when they are justified."

The MIF spokesman listed several sources of aid in setting up a training program for promising young men in the plant. "The Milk Industry Foundation has a Sales Training Institute, The International Association of Ice Cream Manufacturers has its Ice Cream Merchandising Institute, and both associations have publications that can be obtained at very low cost. The dairy departments have short courses and conferences. The state dairy associations have their conventions and the national associations have theirs.

"These future executives should be encouraged to attend the meetings of their local Dairy Technological Societies, with their companies paying their dues," Ellsworth said, adding, "membership in the American Dairy Science Association should be provided also."

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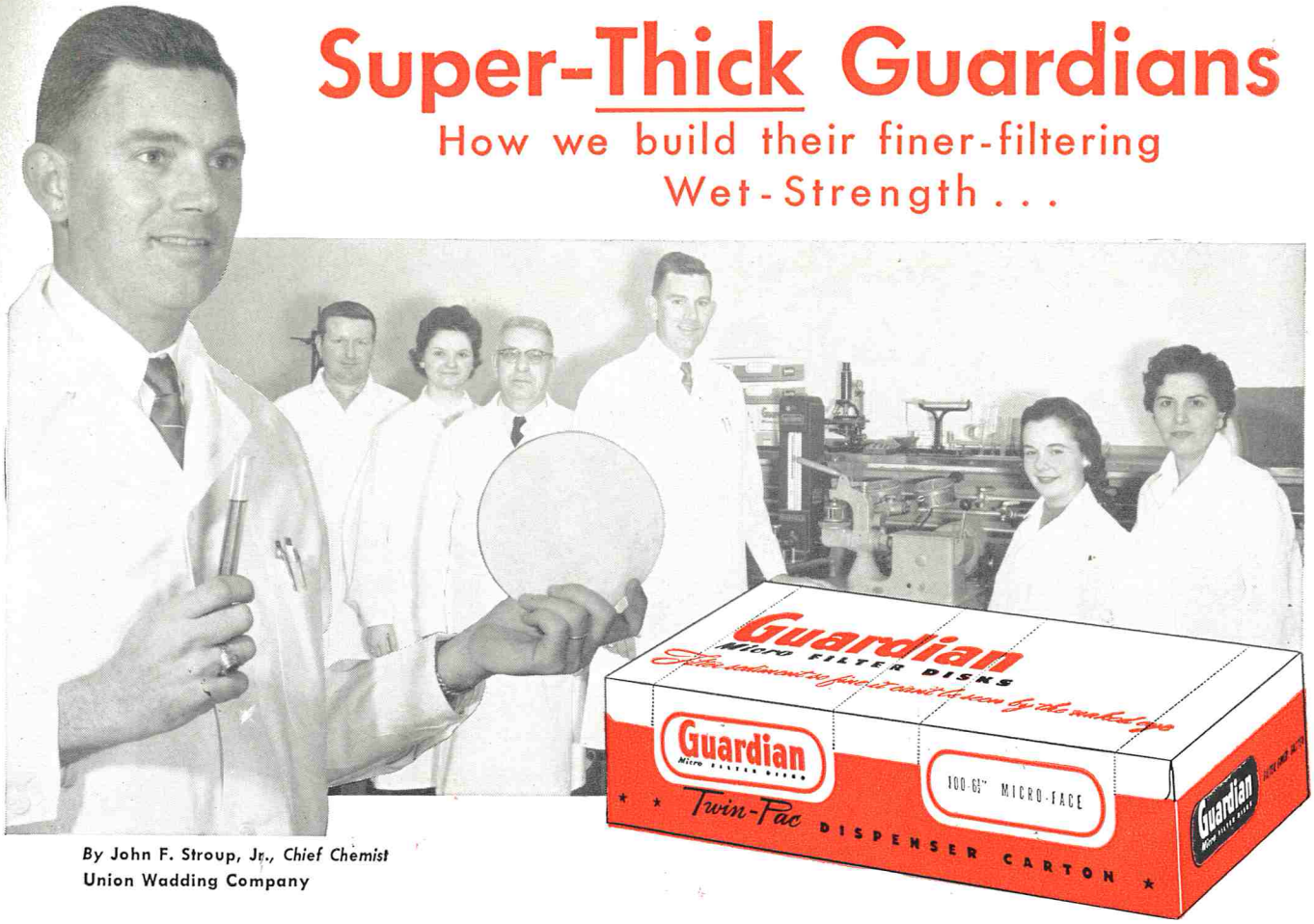

By John F. Stroup, Jr., Chief Chemist
Union Wadding Company

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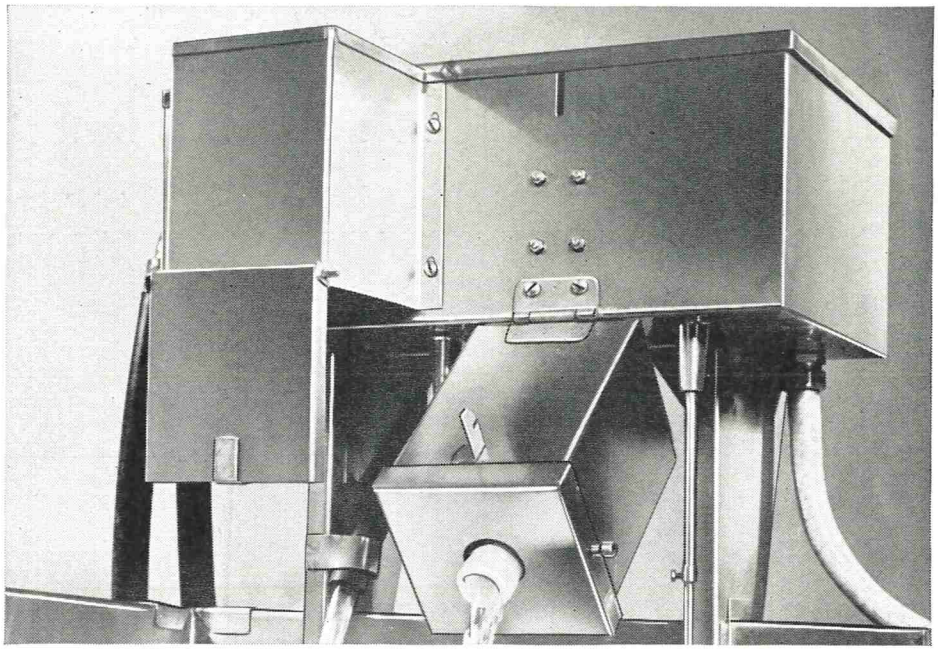

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