BULK MILK DISPENSERS

WALTER D. TIDEMAN and N. A. MILONE
National Sanitation Foundation
School of Public Health, University of Michigan, Ann Arbor, Michigan

DEVELOPMENT

The dispensing of milk in bulk has passed through many stages of development, mostly bad. There is not much that can be said in favor of the old time milk pump nor of the practice of dipping milk from cans into customers' containers especially in over-crowded grocery stores. A major effort to stop this practice in New York City resulted in the creation of the modern approved milk dispenser. When during the depression of the early 1930's Dr. Shirley Wynne, then Commissioner of Health of New York City, decided it was necessary for the protection of the public health to substitute bottled milk for bulk milk, there was strenuous consumer resistance due to an anticipated increase in the price of milk. Apparently for the purpose of establishing the need for this safeguard as well as for the investigation of possible cheaper methods of eliminating the sanitary hazards, he appointed a Milk Commission of distinguished people of which the late Dr. Simon Flexner was scientific chairman.

The commission's report entitled "Is Loose Milk a Health Hazard?" was published late in 1931. The commission recommended the prohibition of the then current practice of selling loose or dipped milk in consumers' containers and also the practice of dispensing loose milk by means of cans and dippers or pitchers to consumers in restaurants. However, recognizing the economic need for low priced milk, the commission established a general specification covering the type of device it felt could be approved for use in dispensing milk from twenty or forty quart milk cans, washed, sterilized, filled and sealed at an approved milk plant and including no part with which milk came in contact that remained in the public eating or drinking establishment where the milk was dispensed.

The commission appointed a committee composed of Dr. Paul B. Brooks, then Deputy Commissioner of Health of New York State and the late Leslie C. Frank, then in charge of the milk program for the Public Health Service, whose responsibility it was to determine whether or not the devices submitted as meeting this specification actually complied therewith and could be approved for use.

Many strange devices submitted mostly by back yard inventors were examined by the commission with great patience. There were some who thought that the specifications never could be met but gradually a small number of dispensers was approved and of these several were produced and marketed.

The specification was incorporated later with minor modifications in the Milk Ordinance and Code and in the Ordinance and Code Regulating Eating and Drinking Establishments both recommended by the United States Public Health Service.

First accepted dispensers

After securing approval of the Board of Health of New York City in 1937 of two devices, only one of which was placed in production, a number of popular restaurants turned to the use of approved bulk milk dispensers. Some difficulties were experienced, as with all new mechanical devices, but they have been quite successfully used since then. Of other acceptable devices two are in production and in use there.

DESCRIPTION OF STUDIES

Viewing the civilian experience with interest but exercising the customary caution in protecting the health of our men in the armed forces, the Armed Forces Epidemiological Board contracted several years ago with the University of Michigan to conduct a research study designed to compare the relative safety of milk dispensed from approved dispensers with other methods of dispensing. With permission reference is herein made to the results of that study.

Objective

The objective was to determine whether in routine day to day group feeding there were any unsatisfactory changes in bacterial content or any public health hazards involved in the use of the so-called approved types of milk dispensers as compared with other commonly used methods of dispensing milk. Close observation was made of the whole milk-handling process with the thought that some dangers might exist which might not be reflected in the bacteriological results and, also, that some potential hazards might be observed which could easily be eliminated.

Procedure

The method of approach used was to compare by bacteriological technics the quality of fresh, whole, pasteurized, homogenized milk sampled at the common source, namely an average milk plant, with such milk as it was served from dispensers of various types and, also, with that served in individual one-half pint glass bottles and paper containers mechanically filled and capped.
Through the courtesy of the manager of residence halls at the University of Michigan, arrangements were made to have milk, purchased under contract from a local pasteurizing plant, served in different desired manners in various residence halls for men and for women throughout the second semester of the school year, 1952-1953. Due to delays, sampling covered only a period of thirteen weeks or a full three months.

Milk in paper and glass half-pint containers was obtained from a University-operated cafeteria and snack bar.

Devices tested

The dispensers examined were the Thomas-Terry, Norris, and Monitor. Two different types of milk pumps were included. Also, for the purpose of the test, milk was served from large aluminum pitchers at one of the employees' cafeterias. For comparison, in addition to the use of these devices, milk was served in one-half pint glass milk bottles and in one-half pint paper containers.

Milk pumps

The two milk pumps, designated as “A” and “B”, included in the tests were different models of the same manufacturer. Both were of the better type which could be disassembled for cleaning with the aid of special tools. These are shown in Figures 1 and 2. Such pumps are subject to the criticism that the can must be open to insert them and there are many parts to be disassembled, washed, disinfected, stored and reassembled at the places of use where the facilities for such operations are generally inadequate. Also the pumps leave a considerable amount of milk in the cans. Although the differences in construction between the two pumps are not great, it would appear that pump “B” is the more easily cleanable of the two.

Dispensers

The three bulk milk dispensers included in this test are those commonly marketed as meeting the requirements for bulk milk dispensers given in section ten of the Public Health Service Milk Ordinance and Code, 1953. These general requirements are:

(a) “It shall comply with the general requirements of item 10) on construction and repair of equipment.

(b) “No surface with which milk or milk products come into contact shall, while in use, be accessible to manual contact, droplet infection dust, or flies, but the delivery orifice may be exempted from this requirement.

(c) “All parts of the dispensing device with which milk comes in contact, including any measuring device, shall be thoroughly cleaned and subjected to bactericidal treatment at the milk plant and not at the retail vendor’s establishment.

(d) “The dispensing device shall be filled at the milk plant and shall be sealed with two seals in such manner as to make it impossible to withdraw any part of its contents without breaking one seal, and impossible to introduce any substance without breaking the other. The use of an embossed seal identifying the milk plant is desirable, so that the refilling and resealing of the container by any person outside of the milk plant can be readily detected.

(e) “It shall mix the milk and cream thoroughly and automatically with each dispensing operation. This requirement may be waived in the case of milk or milk products which remain homogenous without mixing.” "Caution: Experience has indicated that careful cleaning and bactericidal treatment and proper storage and refrigeration of filled cans are necessary in order to prevent contamination of the milk and excessive bacteria counts.”

The devices used were those which happened to be available for testing at the time. Other manufacturers were invited to submit dispensers for testing but failed to do so. Those used were marketed under the names of Terry-Thomas, Norris, and Monitor. They are not
identified in the tables of results but simply designated as dispensers "C", "D", and "E".

These dispensers were quite similar insofar as the refrigerated cabinets are concerned. The differences in outlet tubes are shown in Figures 3, 4, and 5. The new and improved type of outlet later developed by Norris and now in production is shown in Figure 6.

Figure 3. Dispenser can, special with single service white rubber discharge tube.

Figure 4. Dispenser can, with attached single service white rubber tube.

Figure 5. Dispenser can, special can with withdrawable tube, single service valve and cover.

Figure 6. Improved outlet to milk can. Outlet tube is coiled in well and sealed with single service metal cover.

soaker type bottle washer which normally gave satisfactorily washed and disinfected bottles as used in the everyday milk plant operation.

Paper containers

The paper containers were paraffin coated, factory made of the type supplied by the American Can Company, which were filled mechanically at the milk plant.

Plant supplying milk

All milk used in the experiment was supplied by a milk plant processing about 20,000 quarts of milk daily. It is part of a national chain of dairies maintaining its own system of laboratory control. The building is old and somewhat crowded. The equipment meets modern standards but has been in use for a number of years. The pasteurization process involves holding milk at 143° F. for thirty minutes or more. Compared with other milk plants throughout the nation this plant would be rated perhaps a little above average from the standpoint of equipment and efficiency of operation.

Pitchers

The milk pitchers used were of aluminum and somewhat battered but are believed to be representative of pitchers that are likely to be used for this purpose.

Glass bottles

The milk in glass bottles was in standard one-half pint units with plug type caps. The bottles were washed at the plant in a standard
Handling of milk cans

The bulk milk cans used for supplying milk for the various dispensers were washed and disinfected in a mechanical can washer used solely for this purpose. Farmers milk cans were washed in a separate can washer used exclusively for that purpose.

This plant had been accustomed to handling milk in five gallon cans for use in dispensers having rubber tube outlets. For the Monitor dispenser it was necessary to instruct their operator in how to remove and wash the collapsible stainless steel milk tube, how to insert the single service rubber valve and gasket while reassembling the can and tube, and how to heat treat the assembled can before filling.

Filling cans

In filling all cans the traditional and common type of pipe line can filler was used. This consisted of a piece of stainless steel tubing, inserted through a tee in the pipe line, which was lowered into each can to be filled and was removed dripping with milk before being placed into the next can to be filled (see Figure 7).

Personnel and sampling

An experienced sanitarian who, at the time, was taking graduate work in public health was employed part-time to collect samples of milk at the plant three days a week while at the same time taking necessary observation of plant practices. He also collected samples and made observations of milk handling procedures at several of the dormitories where dispensers were used. Another graduate student in public health collected samples and made observations at other sampling stations.

The samples were iced and delivered promptly to the laboratory for examination. Samples from dispensers and milk pumps were taken from glasses filled by the attendant. This factor might be expected to influence the bacteriological results. The milk in glass bottles and paper containers was iced and taken directly to the laboratory in the unopened container. Pouring and contact with the glass was not a factor in the results. Temperatures of the milk were taken regularly and recorded at the time of collecting samples. The samples were taken by means of autoclaved metal milk thieves and were placed in autoclaved screw capped sample jars of approximately 40 ml capacity. The thieves used for collecting samples from glasses were of stainless steel, approximately 11 inches long and those used for collecting samples from milk cans at the plant were of aluminum, approximately 22 inches long.

Tests performed

Standard plate counts were made, using the then standard tryptone glucose extract milk medium. It is recognized that the standard plate count has limitations as a measurement of bacteriological quality but was included because it has long been recognized and used as a yardstick for this purpose. It was felt that these counts, also, might aid in reflecting poor refrigeration as well as in interpreting the results obtained by the coliform tests. Coliform plate counts were made on all samples of milk using standard violet red bile agar. This test was included in the hope of measuring any gross contamination of the milk either at the plant or as dispensed at any of the sampling points. Pasteurization should practically destroy all coliform organisms so that those found generally may be assumed to have been introduced after pasteurization. This test gives more pertinent information than the standard plate count but, of course, is much less sensitive than the fermentation tube method.

Finally every sample of milk was examined by adding to brilliant green lactose bile broth in fermentation tubes one 10-ml portion, five 1-ml portions, and one 0.1-ml portion of milk from each sample and examining each of these tubes
for the presence or absence of gas after incubation at 35°C for 48 hours. The results are reported as most probable number of coliform organisms per 100 ml of sample. At frequent intervals positive presumptive tests were confirmed. This test is recognized as the most sensitive routine method that could be employed to detect chance contamination of the product by dairy plant workers or food handlers, or directly through mishandling of equipment or through failure to properly wash and disinfect the equipment.

As a check on pasteurizing plant efficiency, phosphatase tests were run on samples from each sample station at least once a week.

Finally, occasional direct microscopic counts were made with a view to securing additional information as to the general bacteriological quality of the milk.

RESULTS OF STUDY

Time and space will not permit a presentation of the detailed results of examination of all of the approximate 78 samples of milk collected from each of the 9 sources. However, a summary of the results of these tests expressed in terms of percentage negative or meeting certain stated standards is given in Table 1.

Standard plate counts

Whereas only 52.6 per cent of the samples collected at the plant met the Public Health Service standard of not more than 30,000 standard plate count per ml, 72.4 per cent of these samples met the legal standard.

Table 1—General Summary of Bacteriological Tests on Milk from a Common Source Dispensed in Different Ways During a Three Month Period (Approx. 78 Samples from Each Source)

<table>
<thead>
<tr>
<th>Source of sample</th>
<th>Results of coliform tests</th>
<th>Results of standard plate count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid medium*</td>
<td>Solid medium*</td>
</tr>
<tr>
<td></td>
<td>Per cent negative Rank4</td>
<td>Per cent negative Rank4</td>
</tr>
<tr>
<td>Milk plant</td>
<td>34.2 5</td>
<td>68.4 5</td>
</tr>
<tr>
<td>Glass bottles (½ pt.)</td>
<td>20.6 7</td>
<td>48.7 8</td>
</tr>
<tr>
<td>Paper bottles (½ pt.)</td>
<td>27.0 6</td>
<td>62.2 9</td>
</tr>
<tr>
<td>Pitchers</td>
<td>7.7 8</td>
<td>18.0 9</td>
</tr>
<tr>
<td>Milk pump A</td>
<td>15.4 9</td>
<td>48.7 7</td>
</tr>
<tr>
<td>Milk pump B</td>
<td>40.5 3</td>
<td>73.7 3</td>
</tr>
<tr>
<td>Dispenser C</td>
<td>38.4 4</td>
<td>71.8 4</td>
</tr>
<tr>
<td>Dispenser D</td>
<td>41.0 2</td>
<td>92.3 1</td>
</tr>
<tr>
<td>Dispenser E</td>
<td>42.1 1</td>
<td>86.8 2</td>
</tr>
</tbody>
</table>

*All milk processed at same plant.
*Brilliant green lactose bile broth.
*Violet red bile agar.
*Rain highest; 2 = next highest, etc. (for significance of rank see text).
*Most probable number.
*Dispenser D ranked higher than Dispenser C because of fewer number of plate counts over 100,000 per ml.

Figure 8. New type of can filler.
standard in Michigan of not more than 50,000 per ml. In comparing the results obtained in dispensing milk by various methods, this failure of the milk at the plant to meet a very high standard should be kept in mind because the milk as dispensed cannot be expected to be of any higher quality than the milk at the plant. Some reduction in counts might be expected during the period of 12 to 24 hours of refrigeration immediately following pasteurization. Since the samples of milk at the plant were taken as the cooled milk came from the pasteurizer, somewhat lower counts might be expected in milk sampled as dispensed the following day.

Judging from the results obtained by the standard plate count all methods of dispensing except milk from pitchers and milk pump "A" show practically as good or better compliance with the 30,000 standard as milk sampled at the plant.

Coliform plate counts

The percentage of samples producing no coliform colonies on violet red bile agar plates is slightly higher for dispensers "C", "D", and "E" as well as for milk pump "B" than for milk sampled at the plant. Milk from pitchers gave only 18 per cent negative results, and milk from glass bottles and from milk pump "A" showed an appreciably lower percentage of negative coliform plate counts, while milk from paper containers showed only a slightly lower negative percentage than did milk from the plant. This is recognized as a relatively insensitive test which, however, has a more direct bearing upon possible contamination after pasteurization than has the standard plate count.

Coliform tube method

The first column in Table 1, namely that showing percentage of samples with the most probably number of coliform organisms of less than 1.4 per 100 ml, represents the most critical of the tests performed. Dispensers "C", "D", and "E" and milk pump "B" all showed a higher percentage of tests negative than did milk collected at the plant. Milk from paper containers gave a somewhat lower percentage of negative tests than did milk from the plant. Milk from glass bottles showed a still lower percentage of negative tests, milk from pump "A" still lower, and milk from pitchers rated lowest of all.

Phosphatase test

The results obtained by the examination of a representative portion of the samples of milk from each source by the phosphatase test indicated consistently effective heat treatment throughout the period of the test. This gives assurance that the positive coliform results were due to re-contamination rather than to inadequate heat treatment.

Direct microscopic counts

The results of the direct microscopic examination of the samples were not of sufficient significance to justify reporting them.

Examination of rubber outlet tubes

Critical bacteriological examinations were made of a number of supposedly sterile rubber outlet tubes from both types of dispensers. Each tube was vigorously shaken in 50 ml. of sterile buffered distilled water. Bacteriological tests then were made of the water. Of 18 tubes examined by this method, 15 gave standard plate counts of <500 per ml. and only 3 had counts somewhat in excess of 500 per ml. None showed coliform organisms either on solid or liquid media.

In another series of tests on 24 tubes, half from each dispenser, the interior of each tube was examined by a special technic of rinsing with 15 ml. of sterile buffered distilled water followed by examination of the rinse water. Only 2 of the 24 tubes examined gave standard plate counts in excess of 10, and none were coliform positive on either solid or liquid media. These results are as good or better than those obtained by the examination of other parts of containers or equipment with which milk comes in contact.

Statistical analysis

An analysis of these results by statistical methods showed that there was no significant difference in the results obtained from samples of milk from the plant when compared with that from paper containers, glass bottles, milk pump "B" and dispensers "C", "D", and "E". The differences in milk served in pitchers and that dispensed from milk pump "A" were significant as compared with milk sampled at the plant. For further comparison the results of samples taken at the plant and samples taken from paper containers were combined and compared with the results obtained on milk in glass bottles. This comparison indicated numerically poorer results on the milk in the glass bottles; however, the difference was not statistically significant. By a similar method of comparison the results obtained on samples from milk pump "B" and from dispensers "C", "D", and "E" were not found significantly different from the results on samples from the plant and from paper containers.

These statistical analyses also showed that the differences between results obtained from samples of milk from pitchers and results obtained from the original milk sampled at the plant or from bottles were significant.

Temperature observations

Extensive temperature observations were made at the time of sampling. Duplicate samples were taken for the purpose of determining temperature. Temperatures of milk sampled at the plant varied from 36° - 48° F. Milk from pitchers varied from 40° - 59° F. In glass bottles ran from 41° - 50° F. with a single sample reading 52° F. The temperature of milk in paper containers varied from 42° - 46° F. with a single sample at 52° F. The temperature of milk dispensed from milk pump "A" varied from 46° - 54° F. and from milk pump "B" 43° - 58° F. The temperature of milk from the three dispensers varied from 38° - 52° F. for dispenser "C", 36° - 54° F. for dispenser "D", and 42° - 62° F. for dispenser "E". The temperatures maintained in these dispensers could have been lowered easily by changing the regulators on the refrigerating units. However, they were left as set by the manufacturers.

Special efforts were made to take the temperature of milk that had remained over night in the outlet tubes of dispensers "C", "D", and "E". This temperature in one instance ran as much as 5° F. higher than the temperature of the milk in the can. Generally the difference was only 2° or 3° F. With the original temperature 45° F. or lower such milk still would be below 50° F. Samples of this milk that had remained in the tube also were collected and did not show
significantly different bacteriological results than those obtained on milk drawn later from the can.

Field observations

The good results obtained with milk pump "B" were unexpected although that type of pump is somewhat easier to clean than milk pump "A". Observations in the field indicate that the good results were probably due to efforts above and beyond the line of duty on the part of the woman responsible for cleaning this pump. On inspections made between meals, the pump was found completely disassembled, the parts washed and dried and laid aside wrapped in clean towels, pending re-use. This was not the case with pump "A" and could not be expected in commercial operation.

At the times of sampling, observations were made upon the methods employed in handling milk and, also, inquiries were made as to accidental happenings. Also, the managers of the cafeterias in which samples were being collected were encouraged to report all unusual happenings by telephone. In one instance a rubber discharge tube accidentally was pulled off of a can intended for use in one of the dispensers causing milk to be wasted on the floor. It is believed that the outlet hose is not satisfactorily protected by fastening it on clips in the hollow at the bottom of the can. No difficulties were observed in handling the cans with the rubber outlet tube stored in a steel tube attached to the outside of the can.

In two or three instances the single service rubber valve was pulled out of the end of the metal tube in a can used in another dispenser causing a flood of milk. This happened when the operator withdrew the tube from the can when placing it in the cabinet. The last time this occurred it was found to be due to faulty insertion of the valve by a substitute Sunday operator at the milk plant. The lugs in the valve that fasten in to the flange at the end of the tube had been doubled back upon themselves instead of over the flange so that when the operator inserted a special tool provided to withdraw the tube he pulled the valve out instead of withdrawing the tube with the valve intact. This accidental spilling of milk resulted in an accumulation of dry milk solids between the flange surrounding the outlet opening and the dispensing cabinet.

This is not likely to happen often as it results in economic waste and the operator has to clean up the spilled milk. All these operating difficulties occurred during the first few weeks of the test and did not happen again during the remaining months.

Milk can filler

Observation of the operation of the milk can filler at the plant led to the conclusion that regardless of whether the bacteriological results were favorable or unfavorable this potential source of contamination should be eliminated. It was found that at least two manufacturers are offering a new kind of can filler shown in Figure 8 which offers protection to the milk during filling equivalent to that obtained in the use of bottle fillers. In our opinion the use of such fillers should be required.

Can washing

Another possible hazard not observed in this study due to the use of separate can washers would be the washing of cans, in which the pasteurized milk is to be placed, in the same water used for cans in which the dairy farmers deliver raw milk. Failure to maintain the temperatures of the wash water above 140° F. might result in introducing milk borne pathogens into the cans. It is believed that it is a reasonable precaution to require a separate washer for the dispenser cans. Small operators could use the relatively cheap can scrubber followed by sterilization over a pedal-controlled steam jet.

Conclusions and Recommendations

A review of the data presented herein leads to the conclusion that milk dispensed by means of devices "C", "D", and "E" as well as from milk pump "B" was of a good sanitary quality determined by bacteriological examination as the milk sampled at the plant and as milk from the same source dispensed in individual one-half pint glass bottles or one-half pint paper containers. However, a study of reports of frequent observations by sanitarians in the field lead to the conclusion that the average food handler would not do the work required to keep milk pump "B" in the condition required to obtain the bacteriological results reported herein. Furthermore the residual milk left in the can presents a health problem as it is possible that an economically minded operator might either pour such milk into pitchers for serving or add it to the milk in a partly emptied can. Therefore, the use of this pump is not recommended.

It also is apparent from the field observations that the conventional type of can filler represents a hazard and that the use of the new type of filler comparable with a milk bottle filler should be required. Finally, in our opinion, the practice of fastening the rubber outlet tube by clamps in the bottom of the can presents a hazard, and the protection afforded by a closed well at the outlet of the can or an open metal tube on the outside of the can should be required. It is recognized that there are possibilities in the use of bulk milk dispensers for mishandling of milk by personnel at the milk plant or at the place where the milk is served. However, no equipment is absolutely fool-proof and at the milk plant the human factor may be cancelled out because washing, bactericidal treatment, and filling of dispensers is the responsibility of the same individuals who perform similar functions for bottled milk. It is believed that no greater hazard to health is involved in the use of milk from bulk milk containers than from one-half pint glass bottles.

At present the 3-A Sanitary Standards Committee is working on a standard for bulk milk dispensers. Until such time as that standard is adopted and available it is recommended that the following criteria be applied in the designation of acceptable bulk milk dispensers:

(a) An insulated refrigerated cabinet shall be provided to hold one or more dispenser cans with sufficient refrigeration capacity to maintain cans filled with milk at a temperature not to exceed 45° F. when such milk is placed in the cabinet at or below that temperature.

(b) Surfaces with which milk comes in contact shall be protected at all times from manual contact, droplet infection, dust or flies. Except while the milk can is in the dispenser, the sterilized wrapped
delivery tube shall be in an enclosed compartment to protect it during filling, transportation and storage, prior to use.

(c) The milk container shall be a standard milk can of tinned or stainless steel. The can and cover shall be washable by means of standard can scrubbers and can washers. Under special circumstances a single use disposable can with a similar outlet may be used.

(d) In filling cans at the milk plant the use of the type of can filler with valve similar to a milk bottle filler shall be required. In small well-operated and supervised plants the health officer may wish to authorize the use of the old type can filler with stipulated precautions.

(e) All parts of the dispensing device with which milk comes in contact shall be cleaned and subjected to bactericidal treatment at the milk plant, that is, no such part shall remain with the cabinet at the place where milk is dispensed. If use of a separate can washer is not required precautions should be taken to prevent possible contamination from residuals of raw milk from producers' cans.

(f) The edge of the cover and rim of the milk can used in the dispenser shall be punched with holes to permit sealing by the use of standard lead and wire seals at the milk plant. In sealing such cans one of the wires shall be left loose enough so that the cover can be loosened to provide air relief when the can is placed in the cabinet without breaking the seal.

(g) The part covering the milk outlet shall be either single service and non-replaceable or the outlet shall be sealed with a lead and wire seal.

(h) All rubber parts such as tubes or valves shall be of single service type and sterilized, applied at the milk plant and discarded at the place where milk is dispensed before the empty can is returned to the plant.

Acknowledgements

The investigators gratefully acknowledge the cooperation of officials of the University of Michigan particularly Mr. L. A. Schaadt, Business Manager of Residence Halls; Miss Kathleen Hamm, Cipet Dietitian; Messrs. H. J. Heile and H. P. Wagler, Business Managers of Food Service; Mr. Harold Dunstan, Sanitarium; as well as the cooperation of the managers and dietitians of the Residence Halls in which the various dispensers were located. The manager of the milk plant and his assistants also rendered valuable help in this work. The field and laboratory work was done under the immediate supervision of the authors by Mr. Francis A. Juskiewicz, Mr. Louis Hemphill, Mr. John A. Watson and Mrs. Kerina E. Dormol.

REPORT OF COMMITTEE ON APPLIED LABORATORY METHODS

(Continued from Page 121)

Scientific Advisory Committee, Department of Health for Scotland. 1945.


(10) Knowles, G. T. Director, Milk Laboratory State of Georgia, Department of Public Health, Personal Communication.


CONTROL OF BACTERIOLOGICAL QUALITY OF RAW MILK ENTIRELY BY LABORATORY PASTEURIZED COUNTS

Information was obtained and opinion solicited from a number of people competent to express an opinion. Although a strong affirmative argument was advanced by Past President Barnum, the Subcommittee feels that both raw and laboratory pasteurized counts are necessary. Sour milk could conceivably pasteurize out to a very low count product, while a 100,000 per ml. raw count might not diminish on pasteurization.

It is the Chairman’s belief that, where there is good field service there is less need for the laboratory pasteurization test as a supplement where standard plate counts are made on the raw milk than when other tests (methylene blue, direct microscopic, etc.) are used. This view is substantiated by data from the Chairman’s own files, but it cannot be emphasized too strongly that the type of test used to grade the raw milk is far less important than the adequacy of the field service and enforcement. A really first-rate fieldman can improve a milk supply without any laboratory assistance—though the latter can be a great help—but without good field service the laboratory is likely to find itself just going through the motions but making no progress toward quality improvement.

Apart from the thermodynamic aspect, there are distinct possibilities that undesirable farm practices and conditions may escape detection if reliance is placed solely upon laboratory pasteurized counts to control quality. Tests on the milk before and after pasteurization, supplemented by good field service, appear to be necessary in obtaining a satisfactory quality of milk.

Members of the Subcommittee were F. W. Barber, R. N. Costilow, J. C. McCaffrey, R. B. Parker and G. W. Shadwick with W. K. Moseley, Chairman.

THE NATURE, SIGNIFICANCE AND CONTROL OF PSYCHROPHILIC BACTERIA IN DAIRY PRODUCTS

The members of this Subcommittee, consisting of R. B. Parker, W. S. Mueller, W. K Moseley, F. W. Barber, with J. C. Olson, Jr., Chairman, have compiled a very comprehensive report. It is the recommendation of the Chairman of the Applied Laboratory Methods Committee that this report be published in full as a Journal paper. The Chairman of the Sub-committee has been so advised and the report will be published elsewhere in the Journal.

Members of the Committee on Applied Laboratory Methods: Dr. C. K. Johns, Chairman; Dr. F. W. Barber, Dr. R. N. Costilow; Dr. E. F. McFarren; Dr. W. K. Moseley; Dr. W. S. Mueller; Dr. J. C. Olson, Jr.; Dr. H. B. Richie; Dr. G. W. Shadwick; Dr. H. W. Weiser; Mr. R. B. Parker.