

THE USPHS METHOD OF RATING MILK SUPPLIES AND ITS USE IN THE INTERSTATE MILK SHIPPER PROGRAM¹

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The Public Health Service method of making sanitation ratings of milksheds was developed, for use by States, as an administrative tool for measuring objectively the extent to which communities adopting the Milk Ordinance and Code recommended by the Public Health Service were enforcing its provisions. However, it has proven to have wider application, and is now utilized by the majority of the States to appraise the sanitation compliance status of milk supplies being sold, or offered for sale, in both intrastate and interstate commerce. In view of the current trend toward increased movement of market milk, this rating method should have even greater utility in the years ahead.

Before discussing this rating technique, it is desired to review briefly those milk sanitation activities of the Public Health Service which led to the development of the method.

The milk sanitation program of the Public Health Service is one of its oldest environmental health activities. During the period 1896-1908, comprehensive studies of the role of milk in the spread of communicable disease were undertaken. This work was followed by research studies to identify and evaluate the sanitary measures necessary for control of milk-borne diseases, including studies on proper methods of pasteurization.

In 1923, more than 38 years ago, the Service established an Office of Milk Investigations to assist States in the control of milkborne disease, through the development and maintenance of effective milk sanitation programs at both State and municipal levels. In 1924, a model regulation, known as the "Standard Milk Ordinance," was developed for voluntary adoption by State and local milk sanitation authorities. To provide for uniform interpretation of this Ordinance, an accompanying Code was published in 1927. This model milk regulation, now titled the *Milk*

Ordinance and Code—1953 Recommendations of the Public Health Service (1), has been revised 12 times, since 1924, with aid of a National Advisory Committee. Work on the next revision has already been initiated. The current edition serves as the basis for the market milk regulations of 37 States and over 1900 counties and municipalities.

By 1931, the "Standard Milk Ordinance" had been adopted by more than 450 municipalities in 26 States. Many of these communities requested the Service to assist them in evaluating the status of their milk control programs, both before and after adoption of the Ordinance. Such information was desired to determine whether or not the community milk control program was effective, for it was realized that no matter how detailed the milk sanitation regulations might be, such regulations afforded protection to the consuming public only to the extent to which their provisions were complied with on a day-to-day basis.

It was obvious to the Service that if community milk control programs were to be evaluated objectively, and in a way that the results obtained in one city could be compared with the results obtained in another, it would be necessary to develop a procedure, based on a common yardstick, which would measure the degree of compliance with all essential milk sanitation requirements. In 1927, the Service developed a proposed method for making sanitation ratings of milksheds. This method utilized—as the common yardstick for measurement—the degree of compliance with the sanitary provisions for producer dairies and pasteurization plants specified in the PHS Milk Ordinance and Code. The degree of compliance with bacterial counts and other tests was also included as part of the evaluation of the milk supply. In addition, a procedure for measuring the degree of enforcement applied by the supervisory agency was provided. This method, which is titled *Methods of Making Sanitation Ratings of Milksheds* (PHS Publication No. 658, (2)) was given extensive field trials by both Public Health Service and State personnel before being finalized. It was revised in 1938, and again in 1958 to provide additional procedures applicable to the rating of interstate supplies of fluid milk and milk products.

¹Presented by Mr. Faulkner at the Fifteenth Annual Meeting, Dairy Products Improvement Institute, Inc., Hotel Governor Clinton, New York, New York, February 15, 1962.

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DESCRIPTION OF USPHS RATING METHOD

The USPHS rating method for evaluating the sanitary quality of fluid milk expresses in terms of percentage compliance, weighted on a volume basis, the degree to which producer dairies, receiving stations, and pasteurization plants of a given milkshed, comply with the Grade A requirements of the PHS Milk Ordinance and Code. It provides for separate ratings of producer dairies and pasteurization plants, including their receiving stations, and sets forth a procedure for arithmetically averaging these ratings, in order to arrive at an overall compliance rating for the pasteurized milk supply. Techniques for measuring the degree to which the enforcement provisions of the PHS Milk Ordinance and Code are being applied by the supervisory agency are also provided in the method, together with procedures for computation of enforcement ratings in terms of percentage compliance.

As a basis for computation of ratings, weights have been assigned to each of the major sanitary requirements specified in the Milk Ordinance and Code for "Grade A Raw Milk for Pasteurization" and "Grade A Pasteurized Milk." These weights have been selected on the basis of the relative public health significance of each requirement in relation to the total requirements. In assigning these weights, emphasis has been placed on such items as "health of cows", "cleanliness", "bactericidal treatment", "cooling", "water supply", and "bacterial count", rather than on construction items. For example, in the rating of the raw milk supplies of producer dairies, the item on "health of cows" is assigned a weight of 15 percentage points in the total of 100 points; the items on "cleaning" and "bactericidal treatment" of equipment and utensils are assigned a weight of 5 points each, or a total of 10 percentage points; the item on "bacterial count" is weighted 20 percentage points; while the item on "floor construction" in dairy barns is assigned a weight of only 1 percentage point.

In the making of ratings, all items found to be in violation are debited by the weight assigned to the item, and the total debits multiplied by the gallons of milk involved in the violations. The final ratings are arrived at by dividing this figure—total debits x volume violated—by the total volume of milk sold daily by the producer dairies or plants, as the case may be, which have been included in the rating survey. The resulting figure is then subtracted from 100.

As an illustration of this procedure, if all pasteurization plants, and their receiving stations and producer dairies, which supply a given community or area with pasteurized milk, comply with all of the Grade A requirements prescribed in the Milk Ordinance and Code, the sanitation compliance ratings

of the producer dairies and pasteurization plants, and of the pasteurized milk supply, would be 100 percent. However, if some of the producer dairies, and some of the plants, fail to satisfy one or more of the requirements, the ratings would be reduced in proportion to the weights of the items violated and the volume of milk and milk products involved in the violations.

Data from which ratings are determined are obtained from an evaluation of sanitary practices at producer dairies, pasteurization plants, and receiving stations, and from a review of the records on file by the supervisory agency. It is not necessary, except on very small milksheds, to inspect all plants and producer dairies, since a sufficiently accurate determination of the percentage compliance of the shed with sanitation requirements can be obtained by surveying a statistically representative number of producer dairies and pasteurization plants, including their receiving stations. The minimum number of producer dairies and pasteurization plants to be included in the rating survey depends upon the number of each in the milkshed. A table of the number to be inspected for various sized milksheds is provided in *Methods of Making Sanitation Ratings of Milksheds* (2). If the numbers indicated in this table for a given sized shed are inspected, the probable error in the individual percentages of compliance with the various items of sanitation will be less than 5 percent, provided the producer dairies or plants inspected have been selected at random.

In order to achieve this degree of accuracy, the individual producer dairies or plants selected for a rating survey must be representative of conditions throughout the milkshed. Therefore, it is important that the selection method exclude elements of pre-selection and provide a truly random sample. Several methods for random selection of both producer dairies and pasteurization plants are described in the PHS rating method.

As indicated, the records kept by the supervisory agency are used in determining compliance with total bacteria, coliform bacteria, phosphatase, and temperature requirements. With but certain exceptions, no credit is given for compliance when less than the required number of samples have been examined during the preceding 6-month period. Acceptance of laboratory data is contingent upon the utilization of standard procedures by the laboratories concerned.

The PHS rating method also provides procedures for inclusion of data on the sanitary quality of milk received from "outside" sources. These procedures are based on Section 11 of the PHS Milk Ordinance and Code which is designed to facilitate the acceptance of milk of high sanitary quality from points beyond the limits of routine inspection. Section 11 pro-

vides that the supervisory agency should approve, without duplicating existing inspection services at the source, supplies of milk from any area not under its own routine inspection when such supplies are (a) under the routine supervision of another official agency applying substantially equivalent standards; and (b) have a current rating, awarded by the milk sanitation authority of the State of origin, equal to that of the local supply or, if lower than that of the local supply, equal to 90 percent or more.

If milk is received in accordance with these provisions, such supplies are not included in the computation of local sanitation compliance ratings, provided, the current rating of the imported supply is not more than two years old. However, the name, rating, and date of rating for each current source of milk being received at the time of the survey, are entered on the survey form, together with a notation as to the volume received.

When the milk sanitation rating of the milk being received is lower than the last rating awarded the local supply, and does not equal 90 percent or more, it is necessary to consider the status of such supplies, on a pro rata basis, in the computation of the local milkshed ratings.

In either case, the supervisory agency must have on file records which indicate that the milk has been examined, at required frequencies, and that the total bacterial counts, coliform counts, and temperature requirements have been complied with. Otherwise the ratings are reduced proportionately.

The PHS rating method for evaluating the sanitary quality of milk measures the degree to which a milk supply complies with the requirements of the PHS Milk Ordinance and Code. A rating of 90 percent or more, determined by the methods described, means that the milk and milk products surveyed are as safe and sanitary as reasonably strict enforcement of milk sanitation regulations will make them. In this regard, the Public Health Service has, for many years, encouraged communities to not only attain and maintain their own milk supplies at a 90 percent or higher level, but, when necessary to supplement their supplies from areas beyond their normal jurisdiction, to secure only supplies which have been awarded a 90 percent or higher rating.

USE OF METHOD IN VOLUNTARY INTERSTATE MILK SHIPPER PROGRAM

Because of its demonstrated value, and use by a large number of States, the PHS rating method was adopted by the National Conference on Interstate Milk Shipments as a means of determining the sanitation compliance ratings of interstate milk shippers. The rating method is an essential component of the voluntary State-PHS program for certification of in-

terstate milk shippers and, therefore, it is desired to discuss briefly the manner in which the method is applied in the certification procedure.

The voluntary State-Public Health Service program for certification of interstate milk shippers developed as a result of a situation which occurred during World War II. During the war, large volumes of milk were shipped interstate. Much of this milk was of unknown or questionable quality and pointed up the need for a system which would provide health departments and other milk control agencies with reliable data on supplementary sources of high quality milk.

In 1950, at the request of the Association of State and Territorial Health Officers, the Surgeon General called a National Conference on Interstate Milk Shipments to discuss this matter. The Conference developed a plan, utilizing a cooperative State-Federal approach, for the evaluation of the sanitation compliance status of the supplies of interstate milk shippers and for the dissemination of such information.

Because the PHS Ordinance and Code, or one equivalent thereto, had been adopted as the basis of the regulations of 37 States and over 1900 municipalities and counties, the Conference adopted the PHS Milk Ordinance and Code as the basic milk sanitation standard. The Conference also adopted the PHS rating method as the procedure for determining the degree of compliance with this basic standard. The Conference also agreed that only those milk supplies which were under full-time supervision should be eligible for certification under the proposed plan.

The plan was accepted by the States attending the First National Conference on Interstate Milk Shipments, and the program for certification of interstate milk shippers was initiated in 1951. While the system is voluntary, and embodies the principle of "faith and confidence" in the work of other milk control agencies, it contains a system of "checks and balances" in which the PHS rating method is an essential part.

The agreements governing the voluntary interstate milk shipper program (3), include the following procedures. The milk supplies of eligible shippers are rated by milk sanitation rating officers of the State in which the source of the supply is located. The States report to the Service those shippers whose products and plants have been rated by them in accordance with the applicable sanitary requirements, and the Service publishes quarterly a list (4) of the sanitation compliance ratings of such certified shippers for the information of areas desiring to import milk. No shipper's rating is published without his permission. Ratings, unless revoked or superseded, are valid for a maximum period of 24 months.

As part of this program, receiving States and jurisdictions sample the milk received from sources outside their jurisdiction to determine compliance with bacterial counts, cooling temperatures, and composition standards. Results of such examinations are part of the system of "checks and balances" which have been built into the voluntary program to insure that only shippers of high quality milk are certified.

Another element of this system of "checks and balances" is a requirement for standardization and certification of State milk sanitation rating officers.

Sanitation compliance and enforcement ratings are not accepted for listing unless made by qualified State personnel whose rating procedures have been standardized and certified by the Public Health Service. Further, State milk sanitation rating officers are not eligible to rate those supplies over which they have direct supervisory responsibility for inspection and enforcement. As of July 1, 1961, the Service had standardized the work of a total of 116 milk sanitation rating officers in 42 States.

In order to validate the sanitation compliance ratings submitted by the States, the Service periodically makes check-ratings and evaluates the work of each participating State, including its laboratory program. Such evaluations are designed to insure uniform application of procedures by all participating States and shippers, and to protect against lax enforcement and unfavorable changes in the sanitary status of the shipper's supply. This is another element, and a most important one, in the "checks and balances" system. Still another element is the conduct of ratings by the Public Health Service, when required to settle differences of opinions or disputes between States.

The agreements governing the operation of the voluntary program also contain a number of other provisions designed to insure valid ratings, including procedures to remove shippers from the list for cause.

It is desired to emphasize that the interstate milk shipper program utilizes the existing structure of State and local control to the fullest possible degree. Routine supervision is performed by the local or State agency, as the case may be, having jurisdiction over the supply to be rated. The rating of an interstate milk shipper's supply is a function of the State milk sanitation rating agency, and not of the municipality or Public Health Service. The primary role of the Public Health Service in this program is to bring about the highest degree of uniformity in attitude and performance on the part of State personnel so that any certification of an interstate milk shipper's supply can be accepted with confidence by authorities in other jurisdictions. The Public Health Service does not make ratings of milk sup-

plies for certification, except for those under the jurisdiction of the District of Columbia.

The interstate milk shipper program has grown considerably during the past 10 years. The January 1, 1962, list includes the names and ratings of 794 interstate shippers located in 39 States and the District of Columbia. Of those listed, 215 shipped, or offered for shipment, "raw milk for pasteurization," 376 "pasteurized milk" and 186 both "raw milk for pasteurization" and "pasteurized milk." The average sanitation compliance rating of all shippers of "raw milk for pasteurization" currently listed is 92.99 percent, and the average rating of all shippers of "pasteurized milk" is 93.98 percent.

While these ratings indicate that the sanitary status of the listed shippers is quite high, it is desired to point out that this level of compliance could not have been attained without diligence and without the cooperative efforts of shippers, producers, and control agencies. In the early years of the certification program, it was not uncommon for the States to report to the Service milk sanitation compliance ratings in the 70's and low 80's. In some instances, these low ratings came as a surprise and a shock to both the dairy industry and the official agency concerned, and led to the initiation of programs to improve the sanitary status of such sheds and to improve the enforcement and laboratory control programs. Often, considerable work was required to bring the shed to a level where management desired to have its ratings listed. Frequently, the rating technique has been used to provide a base-line for program improvements by both official agencies and industry.

During the past several years, we have been asked a number of questions concerning the application of the rating method in States which have not adopted the PHS Milk Ordinance and Code, but which wish to participate in the voluntary State-PHS program for certification of interstate milk shippers. A discussion of several of these questions may be of interest.

We have been asked if it is necessary for a State or municipality to adopt, as its official regulation, the PHS Milk Ordinance and Code in order to participate in the program. The answer is "No." However, in order for the ratings to be comparable between States, it is required that the supply of each interstate milk shipper participating in the program conform substantially to requirements specified in the PHS Milk Ordinance and Code. Without this degree of uniformity, there would be no basis for a nationwide program.

We have also been asked if industry inspection and laboratory control are acceptable under the interstate milk shipper program. Industry inspection and laboratory control are acceptable under certain

conditions, and the ratings are not lowered if these conditions are met. To be eligible for listing, a milk supply must be under the full-time supervision of either local health department personnel, State health department personnel, or State agriculture department personnel. The program does provide, however, for acceptance of industry inspection of producer dairies, if industry inspection is a supplement to, and not a substitute for official inspection. At least one inspection of each producer dairy per year must be made by the official agency, with other inspections to be carried out by State "approved" industry inspectors. The interstate milk shipper program also provides for acceptance of the results of industry or private laboratory examination of "raw milk for pasteurization," provided such laboratories are "officially designated" laboratories and have been approved by the State laboratory agency. Approval of such laboratories is based upon surveys made at least biennially, and through implementation of an acceptable split-sample program. These provisions relating to the acceptance of industry inspection and laboratory work do not apply to inspection of pasteurization plants, or to the laboratory examination of pasteurized milk, which must be performed by the official agency.

Still another question which has been asked is whether shippers of milk intended for use in manufactured dairy products and frozen desserts are eligible for certification in the interstate milk shipper program. The interstate milk shipper program was originally designed to cover only shippers of Grade A fluid milk and Grade A fluid milk products. Recently, the program has been expanded to include interstate shippers of Grade A bulk dry milk powder intended for use in Grade A fluid milk products. At present, the program does not provide for certification and listing of the ratings of shippers of milk intended for use in manufactured dairy products or frozen desserts.

CONCLUSION

In conclusion, it is our opinion that the PHS rating method has proven to be a useful tool in milk sani-

tation administrative practice. The results of evaluations made by this method have stimulated and encouraged milk sanitation agencies toward greater effort, and have enabled the dairy industry to carry on more effective quality control programs. The results of rating surveys have also been useful to the dairy industry as a means of promoting increased consumption by focusing attention on the desirability of high quality milk and milk products. Ratings of community milk supplies have also provided citizens and local officials with a basis for judging whether they have been receiving a proper return for their milk sanitation appropriations, and whether such appropriations are adequate to support an effective program.

The use of this rating method in the voluntary State-PHS program for certification of interstate milk shippers has enabled State and local milk sanitation agencies to obtain authoritative information on the sanitary quality of milk imported from other jurisdictions, and, thus, it has been a key factor in facilitating the movement of high quality fluid milk and milk products in both intrastate and interstate commerce. This is indicated by the fact that an increasing number of communities are willing to accept milk produced in areas outside their jurisdiction, without making inspections at the source, when such milk has been awarded a milk sanitation rating of 90 percent or higher.

REFERENCES

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