A CRITICAL APPRAISAL OF MILK SANITARIANS *

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An experience of a quarter of a century in milk sanitation entitles me to the privilege of reviewing that experience and of appraising the methods followed by me and my contemporaries during that period, and currently. This review—limited to shortcomings—is presented thus publicly (a public confession, as it were) in the belief that the observations made apply with equal force to some methods and practices currently followed by some milk sanitarians, and that the enumeration and brief discussion of some of these shortcomings may have a beneficial effect.

It is not my purpose to detract from the credit due milk sanitarians for the progress which has been made in the betterment of milk quality, and the increase in and maintenance of the safety of milk and milk products through the past several decades. Milk is the only food product which has shown a decrease in number of epidemics traceable to it. But, as I look back over my period of milk sanitation activity, I become aware of a considerable degree of inefficiency in the routine, day-to-day conduct of my work, and of some rather serious omissions, not only in my own work, but also in that of many of my contemporaries. Had these inefficiencies and omissions been recognized and rectified, it is probable that we would all be further on the road to our common objective than is currently the case. If they can now be rectified wherever they currently prevail, our future advancement toward our objective will be more rapid, I am sure.

Furthermore, I cannot escape the realization that I have been, at times, rather obstinate in my resistance to change in policy or procedure, and frequently arbitrary in interpretations of the application of policy or regulations, when a less conservative attitude would, in the light of subsequent developments, have been more intelligent.

Although these generalizations might serve to ease my personal conscience and provide me with a mental hair-shirt, they are, without elucidation, unlikely to impress this audience, because a majority of you may feel that you are too advanced to be making the mistakes made by the last generation. I shall, therefore, present my criticisms in more detail.

GENERAL INSPECTION PRACTICES

I stated that I had been rather inefficient in certain of my activities. Those activities included thousands of farm and milk plant inspections—alone in the early days, and with associates more latterly. An essential purpose of those inspections—as is that of most inspections—was to determine the degree of cleanliness of the equipment used. How did I make those determinations? By sight, touch, and smell; precisely the same tools as were used in the 1890’s! It is readily granted that no more refined tools than these are required to note gross shortcomings with respect to the cleaning of equipment; but there are a number of borderline zones or shades between “not clean enough” and “clean,” wherein the decision rested entirely upon my organoleptic and visual perception. Were my hands always clean? Was my vision sharp and clear enough? Was I unjust to the producer or plant operator in terming the equipment “unclean,” or was I remiss in my duty to

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consumers in considering it "clean?" In instances in which I was not able fully to convince the producer or operator of the ineffectiveness of the cleaning operation, but maintained my position in spite of that, or in which I mistakenly assumed the equipment to be clean, could I have employed means which would have made the condition more obvious or more certain? I think that question must be answered affirmatively. But, I never carried a lens or a box of cleaning tissue with me, and I never had the initiative to use a fresh strainer disc, and in my whole experience I have seen very few milk sanitarians do so.

I understand quite clearly that providing themselves with a lens or cleaning tissue, or both, would further burden milk sanitarians with equipment, and that some of them would have to provide them from personal funds. But that does not obscure the fact that inspection based solely upon the unaided human senses is also rather likely to suffer from a certain degree of inefficiency, from at least two points of view: (a) some uncleanness is likely to be overlooked, and (b) a producer or plant operator who is charged with ineffective cleaning is more likely to correct the deficiency if he can be shown evidence to substantiate the charge. And I wonder whether the handling and feeling of equipment with hands which last held the steering wheel or picked up a milking stool can really be justified. If we give the matter mature consideration, the wiping of equipment with the open hand, or the scratching of a surface with a fingernail, is—to say the least—a somewhat unscientific and a crude means of determining its condition.

**Cleaning on Dairy Farms**

Most milk sanitarians recognized the importance of cleaning as a phase of milk sanitation. I, too, knew this, even when I was considerably younger. I failed to make the distinction, however, between knowing that cleanliness is essential and knowing how to effect complete cleaning. The effecting of complete cleanliness is more technical than is generally appreciated. It is dependent upon: (a) the use of an appropriate combination of chemicals, (b) the correct concentration of the use-solution, (c) effective application of the solution, and (d) complete rinsing of adhering solution and suspended matter. When I saw a container of a commercial dairy washing compound in a milk house, I took it for granted that the producer AND his milk house employee, or ALL of the members of his family who help in the milk house, knew how to prepare washing-compound use-solutions, and how to apply them. And when I discovered equipment to be ineffectively cleaned, it was assumed that the cause necessarily was inadequate use of brushes or slovenly workmanship.

I assumed that producers knew how to prepare in proper strength solutions of the washing compound they purchased, because directions usually appear on the container label. In the light of subsequent experience, I am now certain that in many instances I made assumptions—assumptions which were easy to make, due to the fact that they coincided with my hopes, and which made it possible for me to proceed to the next observation or to the next farm without further loss of time. I also realize that I was not singular—in either sense of the word—in making that kind of assumption. Those assumptions are being made all over the Nation, every day (except Sundays and holidays).

I trust I shall not be censured for devoting so much attention to the relation of sanitarians to the cleaning operation. It is a subject, however, which can hardly be over-emphasized. I know, for instance, that in a recent survey of a relatively large number of dairy farms supplying a chain of milk processing plants, it was found that the average annual consumption of
The dairy washing compound was 14 pounds per farm. A rough calculation indicates that the minimum quantity of alkaline cleaning compound needed in the course of a year, in the milk house of a farm producing 30 gallons (three cans) of milk daily, is fifty pounds. If the AVERAGE consumption on these farms was 14 pounds (between 25 and 30 percent of the minimum needed), some of the producers necessarily used considerably less. Whether those producers used too little of the compound purchased in preparing use-solutions, or whether they used the solutions too irregularly, the probable cause of any uncleanliness of utensils discovered is rather obvious. I know, too, that in my own experience, and that of others who are willing to be candid about the facts, uncleanliness of dairy farm utensils and equipment is the deficiency most frequently found by efficient milk sanitarians—even though their tools are only sight and touch. I am not quite willing to conclude that so large a proportion of milk producers are intentionally indifferent—if indifference may be said ever to be intentional—to the condition in which milk-handling equipment is maintained, or that they are so occupied with other farming activities that the time necessary for effective cleaning cannot be devoted to it. I am far more inclined to suspect (a) that they have not been fully instructed on the farm in the technique of preparing use-solutions and of cleaning, or (b) that conditions or facilities in the milk house—particularly in winter—are not conducive to effective cleaning. The point I wish to emphasize is the need for a recognition of the basic cause for the condition which most milk sanitarians agree to be a problem, and the desirability of the adoption of remedial measures. It is not my purpose to suggest or to discuss remedial measures; they are obvious. I do not hesitate to state, however, that this widespread problem, which all milk sanitarians face, will not be resolved by noting that there is a container of a proprietary washing compound on the milk house shelf or floor, and ASSUMING that the milk house personnel knows how to use it, and does use it twice daily.

Cleaning in Plants

Even though pasteurizing plants are generally inspected more frequently by milk sanitarians than are dairy farms, the location and condition in which detergent compounds are kept, the concentrations in which use-solutions are prepared, and the manner in which these solutions are applied, are rarely carefully checked by sanitarians. Les...

Common Oversights

Not only do milk sanitarians make many assumptions, some of which appear to be unwarranted; they also overlook and appear to be oblivious to situations which recur continually. There are also others, but I wish to make reference only to two.

The first is the maintenance of the necessary concentration of the washing solutions in can- and bottle-washers, particularly the former. We know, if we devote any thought to the matter, that the washing of each can, or row...
of bottles, reduces the cleaning power of the washing solution to an extent predetermined by the chemical nature of the compound used and by the degree of soilage of the cans or bottles. In other words, there is a limit to the number of cans or bottles which can effectively be cleaned by a solution of a given concentration. Continued use of such a solution, after this limit has been reached, would necessarily result in ineffective cleaning, UNLESS THE STRENGTH OF THE SOLUTION IS BOOSTED BY THE ADDITION OF MORE COMPOUND. Detergent manufacturers and dairy plant managements (but not as many milk sanitarians) have learned this from experience; and can-washer operators undertake to counteract this phenomenon in the following manner: The can-washer solution tank is freshly charged every morning. If the desired concentration of the solution necessitates a charge of a certain volume or weight, an excess over that quantity is added. The excess over the prescribed concentration assures adequate cleaning power of the washing solution for a certain number of cans, determined by experience, or possibly by rule-of-thumb. The operative's intent is to add more washing compound to the solution in the tank when the number of cans washed approaches the predetermined number. However, this manual maintenance of washing solution concentration is subject to the usual vagaries of human behavior, distractions, etc., so that in many instances more than the predetermined number of cans have passed through the washer before up-keep is added—in an amount which may or may not be adequate. This cycle of depletion and boosting of washing solution strength continues throughout the can-washing run, in consequence of which a graph of progressive solution strength would have a distinctly “saw-tooth” profile, a portion of which would lie below the desirable concentration level.

The implication of this profile should be obvious. Milk sanitarians expect ALL—not only a variable portion—of the cans discharged from a can washer to be clean, and milk producers look for clean cans to be returned to them EVERY day. Those desiderata cannot be assured, regardless of the mechanical design and operating condition of the can washer (about which there has recently been considerable comment and activity), if a varying percentage of each daily run of cans is subjected to washing with solution which is too weak to remove all of the residue left in the cans by the pre-rinse. Is it not evident that milk sanitarians, in a proportion which reflects seriously upon the extent of our acquaintance with normal can-washer operation, have been—and are currently—quite oblivious of this inevitable chemical reaction in can-washing solutions? I am aware of no organized or concerted action directed toward mandatory maintenance of adequate can-washing solution strength, which might be advanced in refutation of that circumstantial evidence. Is it possible that we have been focusing on some of the smaller trees so long that we cannot see the forest?

The second item of oversight to which I wish to refer is the condition of the interior of transportation tanks, although I propose to be very brief. I merely wish to call attention to the observation that a thorough inspection of the interior of a tank—storage or transportation, but especially the latter—cannot be made by leaning over or into the man-hole and directing a flashlight beam at the ends and periphery. A tank must be entered to be cleaned; it must also be entered to be inspected. Entry necessitates the wearing of coveralls, rubbers, and a cap, and the use of a strong flashlight or of an electric light with a good reflector, on an extension cord. Should this discussion inspire any of this audience to inaugurate the closer inspection of milk transportation tanks, they are warned not to make the potentially
fatal—and I mean FATAL—mistake of using an extension cord without a transformer (voltage reducer) somewhere in the line. The word “electrocuted” in a news item is so final! Any less prepared effort at milk tank inspection constitutes little more than a pretense. I ought to know, because I thought I had been inspecting tanks quite conscientiously, until I learned how to do it effectively.

MISDIRECTED ZEAL

Thus far I have discussed inspection inefficiencies of milk sanitarians. The other end of the behavior scale—misdirected zeal—also warrants consideration. It is possible that I have inappropriately used the term “misdirected zeal.” In any event, there are two types of behavior which, in my opinion, are subject to a certain degree of criticism. These are: (a) the effort to restrict milk producers and plant managements to the use of equipment or supplies of specific manufacture, and (b) the tendency (generally limited to administrators) to oppose the use of equipment or products, or the adoption of methods, which depart from the conventional, but which may be the forerunners of real progress in our profession.

Taking up the first of these types in detail, I have read many milk ordinances and statutes, but I do not recall ever having noted a provision that a specific trade-marked product must be used. Nevertheless, it is a matter of common knowledge that milk sanitarians, here and there, from time to time (possibly in an effort to be of assistance), advise producers and plant managements what make of equipment or what brand of product to use or stock. However sincere such advice from an officially-connected milk sanitarian may be, it is usually regarded as specific instruction by the recipient, who draws his own conclusion.

Every milk sanitarian knows how easy it is to make reference, in conversation, to a product by its trade name, when discussing the remedy for a condition with a producer or plant superintendent. (Some classes of product have actually come to be known throughout the industry by the trade names of their prototypes.) In general, those slips of the tongue may be considered accidental and unintentional. When, however, officially-connected sanitarians specify that products or equipment bearing specific trade names are to be used, and prohibit—by innuendo or by instructions to local dealers—the use of similar products or equipment of other brands, they exercise a prerogative and authority not vested in them, and subject themselves, and their superiors, to the suspicion that their motives are not limited to the improvement or maintenance of milk quality. It has been my unenviable experience to have been, at different times, on both sides of such situations, and I can, from that experience, give positive assurance that these situations have explosive potentialities for serious embarrassment to those, even remotely, involved. I wish to make it clear, however, that this criticism applies only to officially-connected sanitarians, not to those engaged primarily in instructional activity, whose function it is to advise producers.

I recently visited the Pacific Coast states, and learned about and saw a number of developments in milk-handling which deeply impressed me. Most of you know, I suppose, that California production of milk for fluid consumption is conducted on a scale of a magnitude different from that in the Mississippi Valley and the East. A 75-cow dairy is considered small, the average ranges between 300 and 450 cows, and there are some at which over 1,000 cows are milked. The cows are confined and fed in a corral, the milk is cooled and stored in cold-hold tanks, and is transported to the pasteurizing plant in tanks. This is a relatively localized development, re-
resulting from such local economic factors as land value, climate, cost of labor, and arability of the land, and is of interest rather than of significance to those of us who reside and carry on our work elsewhere. But I did also note several practises in milk-handling which appear to have significance for all of us.

Raw milk pipe-lines are, in a number of instances, rarely dismantled for cleaning. Instead, cleaning and bactericidal solutions are pumped through them. This procedure is followed at numbers of the farms at which milking machine combine systems are in use. These lines are from time to time broken for inspection by Health Department or Dairy Service Bureau personnel, and I was assured that the condition of the pipe lines is excellent and that bacterial content of the milk from dairies following that cleaning and bactericidal treatment practice is consistently under 25,000 per ml.

Rubber hose is used to transfer milk from farm storage tanks to transportation tanks, and to empty the latter. In this instance, also, the apparent liberality of milk control administrators appears to be justified by the record of laboratory findings.

I cite these two instances of rather sharp departure from conventional practises in most other sections of the Nation, because they constitute an index of the startling contrast in the viewpoint of administrators there and elsewhere, the contemplation of which generates the suspicion that some of us may have become ultra-conservative in our views and in our tendency to maintain the status quo. This latter theme might be elaborated upon; but my time is growing short, and I have, I think, already sufficiently clearly indicated the general nature of my views.

In this critical appraisal of milk sanitarians the obvious—the commendation for hard-won achievements—has deliberately been omitted. That omission should not be taken to connote that I am a misanthrope who sees only the dark side of the picture; I recognize our achievements, but I feel that commendation comes with better grace and has more savor when received from outside our ranks.

I realize that I have been sharp in some of the criticisms presented. If they appear to have been directed specifically at any individual—present or absent—be assured that that has not been my intent. Bear in mind that I have admitted my personal remissness in most of the matters discussed, and that I get around considerably. If, after these remarks, anyone still feels offended, I recommend that he suffer in silence, and avoid betrayal by acknowledgment of his shortcomings.

This paper has really been directed at the younger members of this Association who are engaged in official milk, or milk and food, control activities—maybe I should use the old term, “inspectors.” Like Napoleon’s troops, all of whom potentially carried in their knapsacks a marshal’s baton, every younger member of this audience is potentially a milk or food sanitation administrator. I have discussed practises which, I trust you will agree, should be avoided, and policies which might well be carefully weighed, and possibly modified. Unless the tendencies described are curbed, the rising curve of public approbation of our profession is likely to break into a sharp decline—a development of far greater import to you who will eventually succeed us than it has been to us, who bequeath it to you.