RESEARCH AS IT AFFECTS THE MILK SANITARIAN*

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The milk sanitarian occupies a special place in the dairy industry with equal responsibility to all segments: producers, processors, distributors, and consumers. The entire industry is dependent upon the technical competence and personal integrity of the members of this group. The primary function of the milk sanitarian is the enforcement of regulatory laws. The regulatory laws are by their nature restriective in character and by reason of this restriective nature tend to limit the application of research. The milk sanitarian of the future will need to have knowledge that will enable him to exercise judgment in a much wider field than is now necessary. As research findings continue to modify processing techniques, it is their responsibility, first, to insure the safety of the public from harmful materials, and secondly, to avoid unnecessary restrictions that will retard desirable progress.

It is with a warm feeling of pleasure that I address this organization, the California Association of Dairy and Milk Sanitarians, because I number among your members many good friends of long years standing. I feel also a keen sense of responsibility and obligation to contribute in a worthwhile manner to your annual meeting program. That sense of responsibility and obligation stems in part from the high esteem with which I regard your individual and collective activities.

As a group, you occupy a special place in the dairy industry; you are in the industry but not of it. Your position is that of an intermediary with obligations to no single element of our industry, but with equal responsibilities to all segments: producers, processors, distributors, and consumers. To carry out these responsibilities in an effective and unbiased manner requires not only technical competence, but also personal integrity and tact on the part of the individual members of your group. The dependence which the entire industry places on your work, and the confidence with which your actions are accepted, testify fully that you and your colleagues throughout the country possess these attributes. Your actions are consistently motivated by high purpose, and it is a privilege to talk to you on this subject in which I am so vitally interested.

I have chosen to talk about research and its effects on your activities. Since I seem to talk about it at every opportunity, I suspect that eventually people may get the idea that I believe research is important. And if they do get that idea, they will be right. Research is of the utmost importance to the dairy industry. I should like to point out just how various phases of the dairy industry are affected by it, because you in the regulatory service are affected directly or indirectly by everything that affects any part of the industry.

Research Defined and Illustrated

First, what is research? Research is the discovering of new facts and principles. It is sometimes extended also to the application of these principles or the putting them to work. But the discovery is the first order of business. Once facts are known, they will be put to use in due time. Sometimes new facts are of immediate usefulness, and sometimes their value does not become apparent for a long time. But no one can estimate the value of a new fact.

To take a familiar example: Louis Pasteur accomplished many things in his life, but all the rest of them pale into insignificance beside the discovery of the fact that heat would destroy organisms of fermentation in wine. Who can say what that new fact has been worth to the food industry? Or to cite another example, someone observed many years ago that changing the intensity of light, impinged on some metal surfaces, generated an electric potential. Not a very exciting observation in itself, but consider some of the uses this new fact has been put to. It will open doors for you without your lifting a finger. It will tell you how long to open your camera lens to get a good picture. It will count automobiles on the highway, and lately it has been put to use sorting lemons into different size groups. Every day new uses are found for this simple fact. And so it is the discovery of new facts that makes technological progress possible.

Research in Dairy Industry

And now I would like to have you consider with me the importance of research in specific fields in the dairy industry. First, let's take education, because you are all products of technological education, and because I am somewhat familiar with it. How do teaching and research supplement each other? In our land-grant colleges of agriculture, we have both experiment station research and classroom teaching.

Because the experiment station research is usually aimed at trying to solve some of the more pressing practical problems of the times, it is frequently thought of as being completely divorced from the teaching functions. This is far from the case. The research program provides the foundation for all teaching; it pro-

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vides the subject matter. Without research we should be using the same textbooks that were in use 50-75 years ago. Textbooks need frequent revision these days because of the pressure of new developments. Research also influences or should influence, the individual instructor. If he is to be aware of the latest developments in his field, he must, of necessity, be active in the research phases of his specialty. If he relies solely on textbooks for his subject matter, his teaching is stereotyped and lifeless, because textbooks are out-dated before they are printed. I maintain with sincere conviction that instruction at the University level is inadequate unless both the individual instructor and his departmental associates are simultaneously engaged in an aggressive research program. Their science then becomes a living, personal, and timely matter; it is not a mere repeating of second-hand textbook information.

It seems hardly necessary to discuss the effects of research on plant operational procedures because you are in contact with new developments continually. There are, however, some points in this connection I want to call to your attention. A few weeks ago our staff was requested to prepare a list of the technological developments in the dairy industry covering the period since 1930—the last twenty years. When we had the list compiled, together with a concise description of the individual items, it covered ten type-written pages and included practically all of our present day processes. In other words our current operational procedures are developments of the last twenty years. This certainly is an impressive example of the impact of research on the dairy industry. These developments include our present cleaning practices, plate heat exchanges, paper containers, bulk handling on the ranch, direct steam injection heating and vacuum flash cooling as in "Vacreation." They include also metal churns, and continuous buttermaking, aseptic packaging, the widespread adoption of stainless steel as a fabricating metal, and the tremendous increase in homogenized milk. Others that might be mentioned include the phosphatase test which is a valuable tool for you, the adoption of continuous freezers for ice cream manufacture, and the packaging developments for cheese, dry milk, and many other dairy products.

RESEARCH GENERATES CHANGE

This recitation of these developments should impress one fact strongly on your minds—and that is that research generates change; it is the enemy of stagnation; it promotes technological progress.

What then are the broad implications of the effects of research, this great catalyzer of change, on the work of the milk sanitarians? Your primary function is the enforcement of certain regulatory laws affecting the dairy industry. Now regulatory laws are by their nature restrictive in character. They set forth that certain essential acts shall be performed in a particular way; within their scope they retard changes; they tend to maintain the status quo. Therefore, you, as law enforcement officers, are the custodians of the status quo.

Such an analysis would seem to indicate that a milk sanitarian's duties place him in opposition to new developments. This may or may not be true. Certainly there are instances where it has worked that way. But you and I know, however, that the group here today has been a strong supporter of sound new developments, and I have every confidence that it will continue in that attitude. Certainly the milk sanitarians and the public health officers are entitled to the major share of the credit for the high sanitary quality of the milk in this country today. The problem of how to get a uniformly safe bottle of milk has been licked largely due to their ideals and efforts. The major developments in milk sanitation have been achieved. In this respect the continuing status is eternal vigilance to retain our present position.

The developments of the future will follow a different path and will require a wider and somewhat different scope of knowledge on the part of the regulatory officer, if he is to make a comparable contribution to progress as he has in the past.

Research in dairy industry and its application in new developments will take the direction of emphasis on the individual milk constituents and their use in products which best serve the nutritional needs and taste desires of the consuming public. Indeed, research of this nature is already in progress, and product applications are being made from it. This type of research and the applications from it will increase as time goes on.

We can expect to see on the market, in addition to our conventional products of today, what have aptly been called tailor made products; products made up of varying proportions of milk constituents processed so as to have predetermined properties. Because milk in its natural form is the ideal food for a young calf, it does not follow that its constituents are in the proper proportion for all uses by man. And so there is under way today a considerable amount of research that will tend to produce dairy products perhaps radically different from those we are so accustomed to today.

SOME POSSIBLE DEVELOPMENTS

It is conceivable also that competition may force us to abandon the long held notion that the composition of dairy products is "sacred" and nothing can be added to them. I believe the time will soon be at hand when we shall petition our regulatory agencies forcefully for permission to add specific harmless ingredients to many of our established dairy products in order to improve their flavor or prevent their rapid deterioration. We already know how to prevent some of the most troublesome flavor problems in the dairy industry through the addition of certain materials that are not only harmless but in many cases actually nutritious. I am sure that liberalization of our attitude will soon prevail.

Such developments as I have just mentioned will require careful conduct on the part of the present-day milk sanitarian. He will no longer be solely a milk sanitarian, in fact his scope is much wider than that now, and the term is a misnomer. The sanitarian, or his counterpart, will need to exercise careful appraisal and judgment first to insure the safety of the public from harmful materials, and secondly, to avoid unnecessary restrictions in retarding desirable progress.

I have not the slightest doubt that the milk sanitarians will continue to show the same leadership in this wider field that stamped their work when it was more nearly strictly sanitarian in nature.